Supplmental Materials and Analysis

[authors removed for anonymous review]

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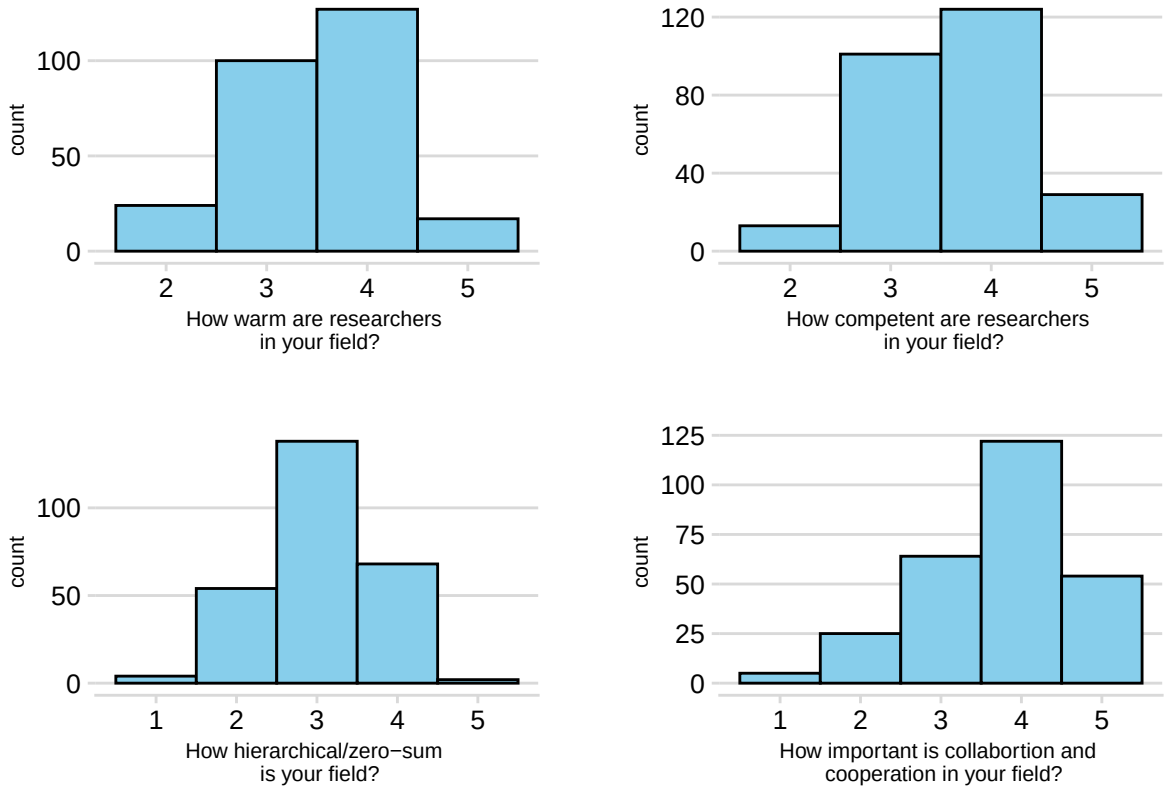
This is supplemental analysis and figures for the manuscript, "Beliefs about social dynamics and Open Science"

1 Study 1

1.0.1 Frequency of scores on combined questions for each factor

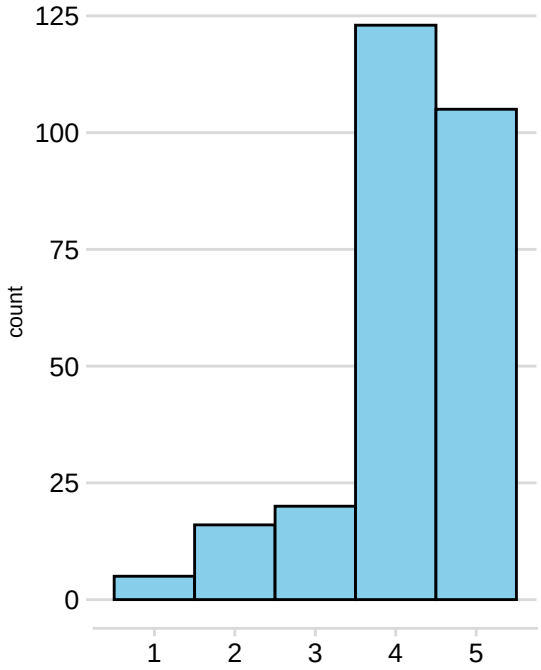
First we will plot the histograms for each factor, warmth, competence, hierarchy/zero-sum, cooperation/collaboration



1.0.2 Frequency of Individual Answers

Now we will plot the histograms of the individual items in our hierarchy/zero sum scale. Note for all plots, 5 means 'strongly agree'. However, some items were reverse coded for the factor analysis etc.

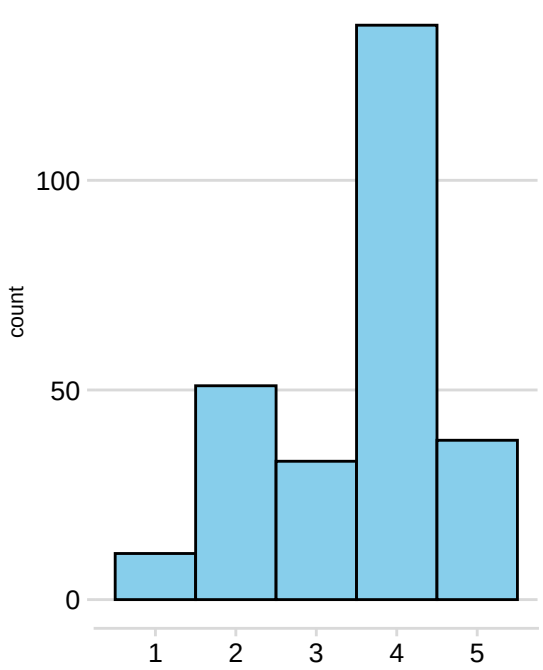
Hierarchy



There is a hierarchy, ranking, or pecking order in (participant field), and the people at the top have the most influence on which scholarship is valued

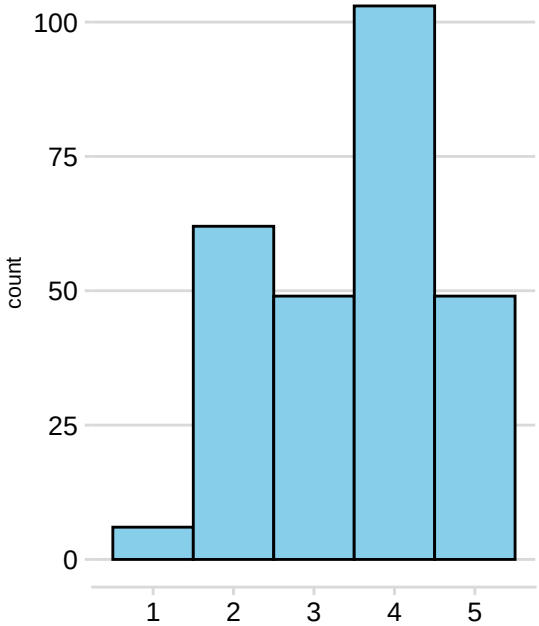
27

Junior



In (participant field),even graduate student researchers who have exciting new ideas or perspectives are able to influence which scholarship is valued.

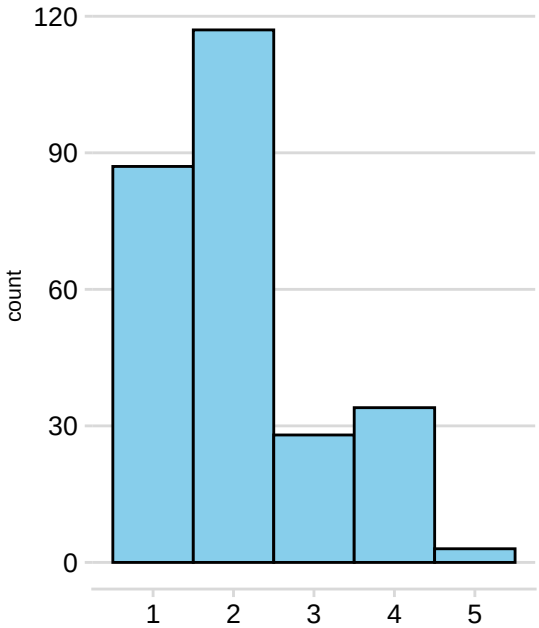
Norms.Prestige



The norms and best practices in (participant field) are decided by the highest−ranking members or most prestigious researchers without much input or influence from less well−known researchers.

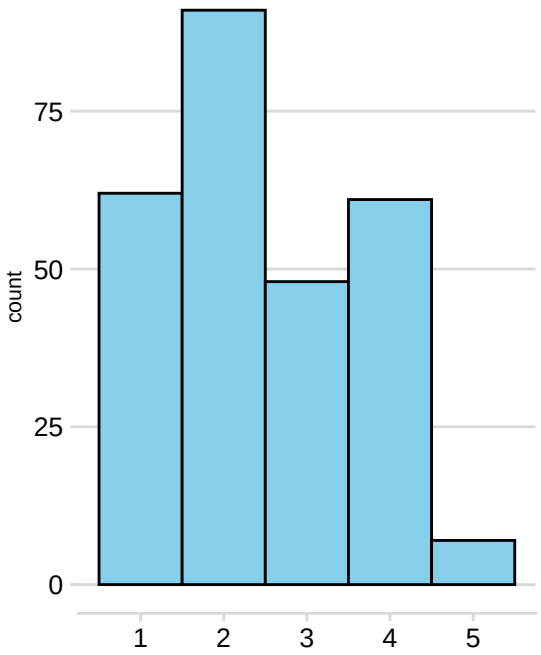
28

Norms.less.well.known



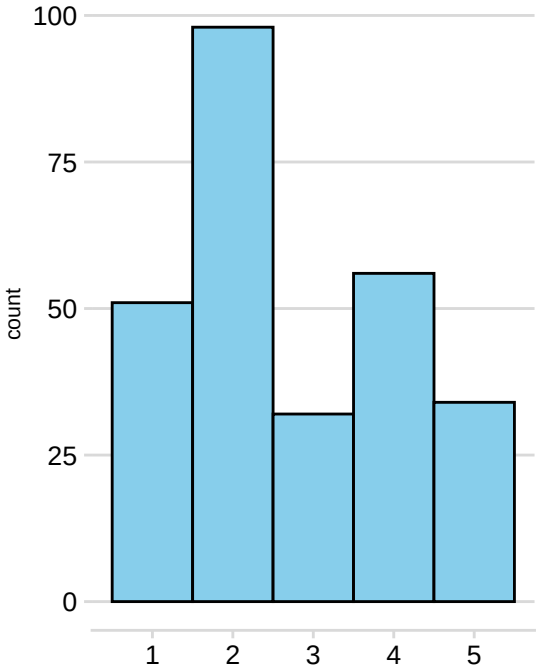
Less well−known researchers have as much or more influence on the norms and best practices in the field of (participant field) compared to prestigious or well−known researchers

Stealing.Ideas



In order to succeed in (participant field) researchers must be wary of other rsearchers who may steal ideas or disrupt others' research

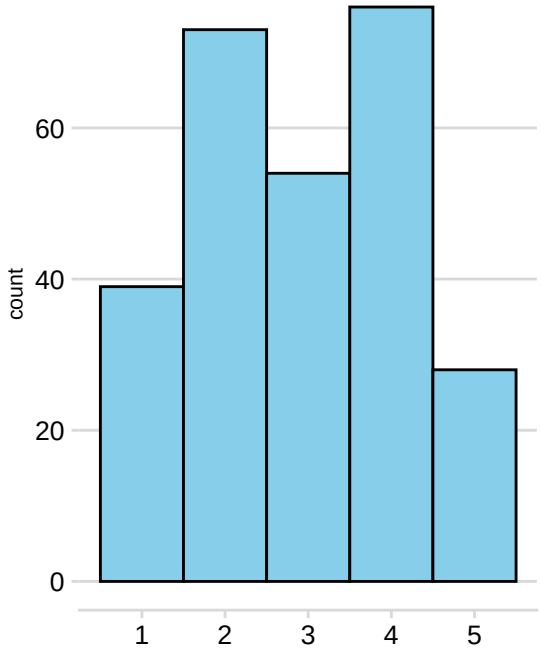
ZeroSum



Success in (participant field) is a zero−sum game thainevitably has a few winners and many losers

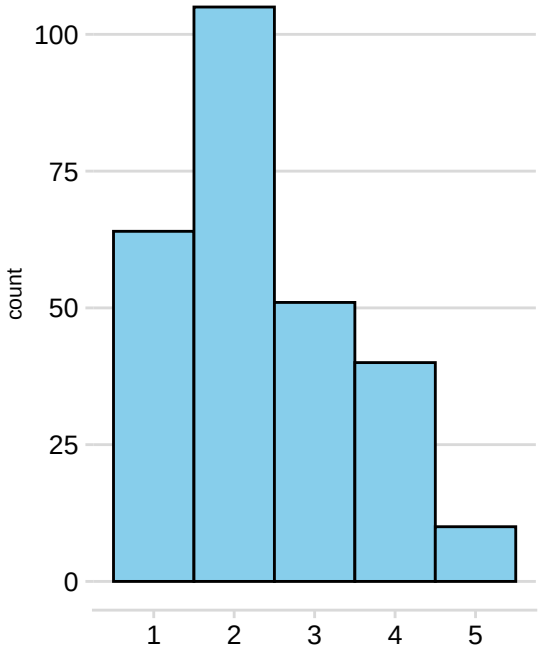
29

Seminar



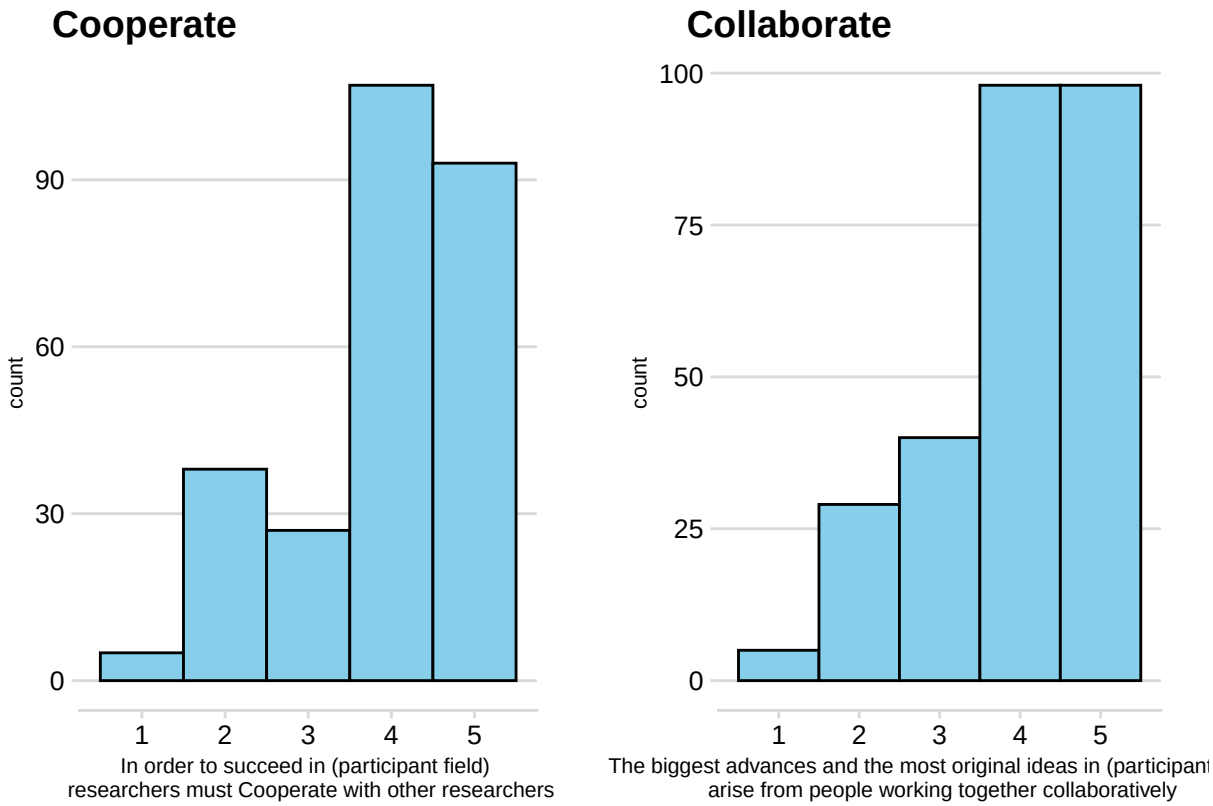
At a typical symposium or seminar talk in (participant field), graduate students and early career researchers ask as many questions as senior faculty.

Conference



In (participant field), questions addressed to graduate students and early career researchers are likely to be patronizing or hostile.

30

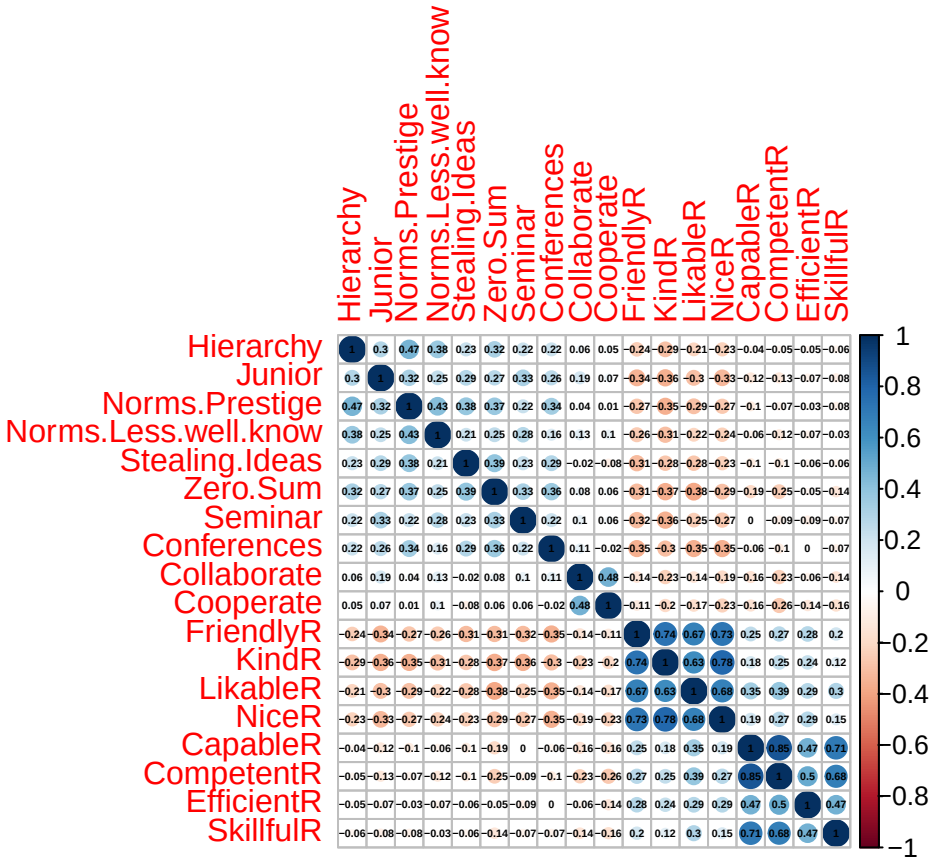


1.0.3 KMO analysis for all questions

```
## R was not square, finding R from data
```

The KMO for the social dynamics questions is 0.846097242429592 which tells us whether its worth doing a factor analysis. Anything over .5, or conservatively .6 means we can do a factor analysis. Bartlett's test for sphericity also yielded a significant result (X2=2029.87764552265,p=0)

1.0.4 Correlation Matrix for all questions



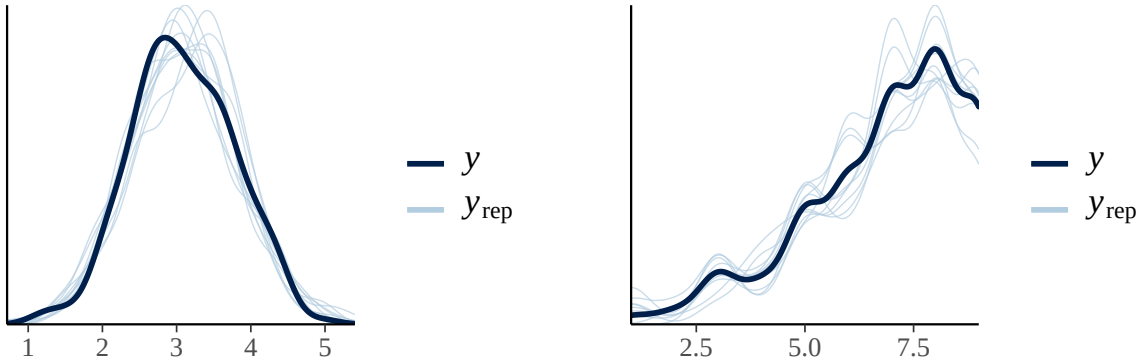
This is a correlation matrix for all items. Interestingly competence is *not* correlated with the hierarchy/competition items. The warmth items are negatively correlated with a lot of questions about hierarchy and zero-sum, which is unsurprising.

1.1 What predicts participants' perceptions of the social dynamics in their field?

Below is an exploratory analysis (not pre-registered). To investigate this question we used the package brms [@bürkner2017] to fit a cumulative model, and ask whether participant's answer to, "To what extent do you identify with your field", and the number of years (log transformed) they had been in their field predict their scores on the hierarchy/zero-sum factor.

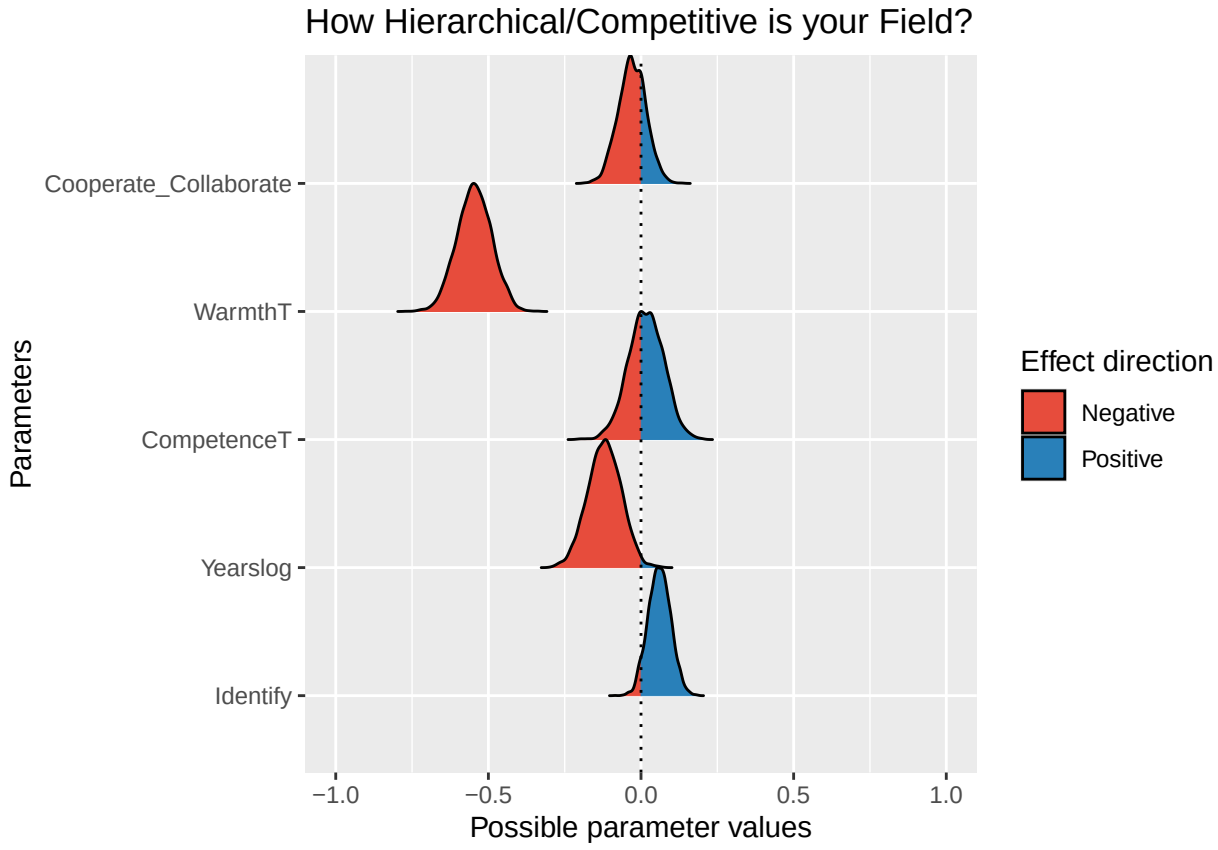
1.1.1 Model Checks

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```

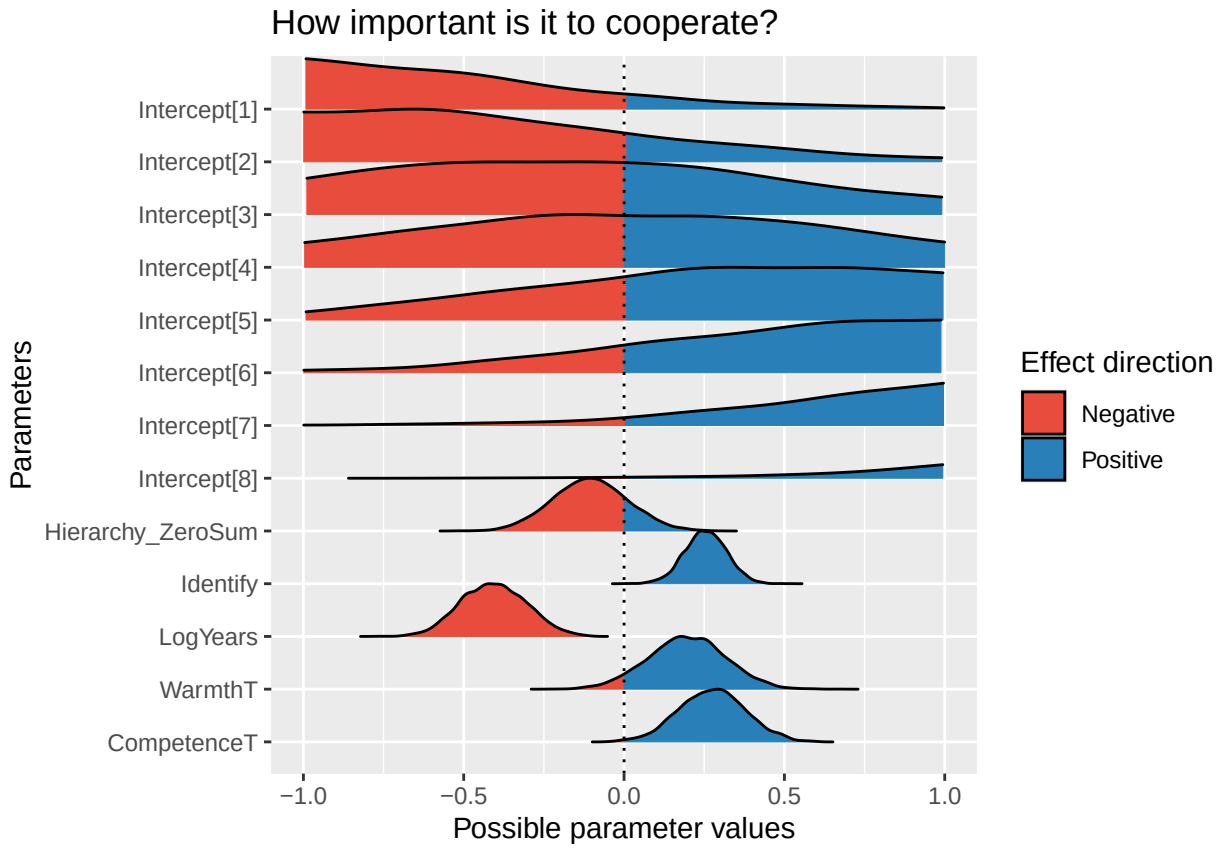


These are ok model fits. We calculated a Bayes Factor here to compare the full and null model (that does not include the number of years that a participant has been in their field). We find strong evidence that log transformed years predicts participants' score on the Hierarchical/Competitive factor (BF=0.34509592304356), where academics that have been in their field longer think their field is less hierarchical. We also find that that log transformed years predicts whether you think Cooperation is important (BF=491116.159784557). we don't find evidence that identifying with your field predicts your score on the Hierarchical/Competitive questions 0.150428994564089 in favor of the null, but we do find evidence that how much you identify with your field predicts how much you think cooperation/collaboration is important (BF=324.964306260035).

1.1.2 PD analysis



```
## Probability of Direction
##
## Parameter              |     pd
## ------------------------------
## (Intercept)            |   100%
## Cooperate_Collaborate | 73.55%
## WarmthT                |   100%
## CompetenceT            | 60.62%
## Yearslog               | 98.83%
## Identify               | 94.45%
```




```
## Probability of Direction
##
## Parameter          |     pd
## --------------------------
## Intercept[1]       | 94.35%
## Intercept[2]       | 86.52%
## Intercept[3]       | 62.15%
## Intercept[4]       | 51.28%
## Intercept[5]       | 75.05%
## Intercept[6]       | 89.12%
## Intercept[7]       | 97.60%
## Intercept[8]       | 99.78%
```

```
## Hierarchy_ZeroSum | 81.65%
## Identify          | 99.98%
## LogYears          |   100%
## WarmthT           | 94.53%
## CompetenceT       | 99.60%
```

The 'probability of direction' analysis agrees with the Bayes Factor, and additionally finds that the more you think people in your field are warm, the less you think it is hierarchical/zero-sum. Moreover, the more you think others in your field are competent the more you endorse the questions about cooperation and collaboration.

1.1.3 Frequentist Model

The frequentist tests agree with the Bayesian analysis. We find that the number of years a person has been in academia negatively correlates with how much they see collaboration and cooperation as important (p= 0.0308352). We also find that the more you see people in your field as warm the less hierarchical/zero-sum you see it (p= $2.6269193 \times 10^{-18}$).

Next we asked what predicted people's answers to the Cooperation and Collaboration questions. We found that the number of years a person has been in academia negatively correlates with how important a person thinks collaboration and cooperation is in their field (p= 3.0192607×10^{-4}). We also found that the more a participant said that people in their field were competent, the more important they thought collaboration and cooperation were (p= 0.0163196). Finally the more someone said they identified with their field the more they thought that collaboration and cooperation were important (p= 2.618029×10^{-4})

1.2 Study 1: Survey items

This is the text of the questions and how they load onto factors.

The following items load onto the hierarchy/zero-sum factor:

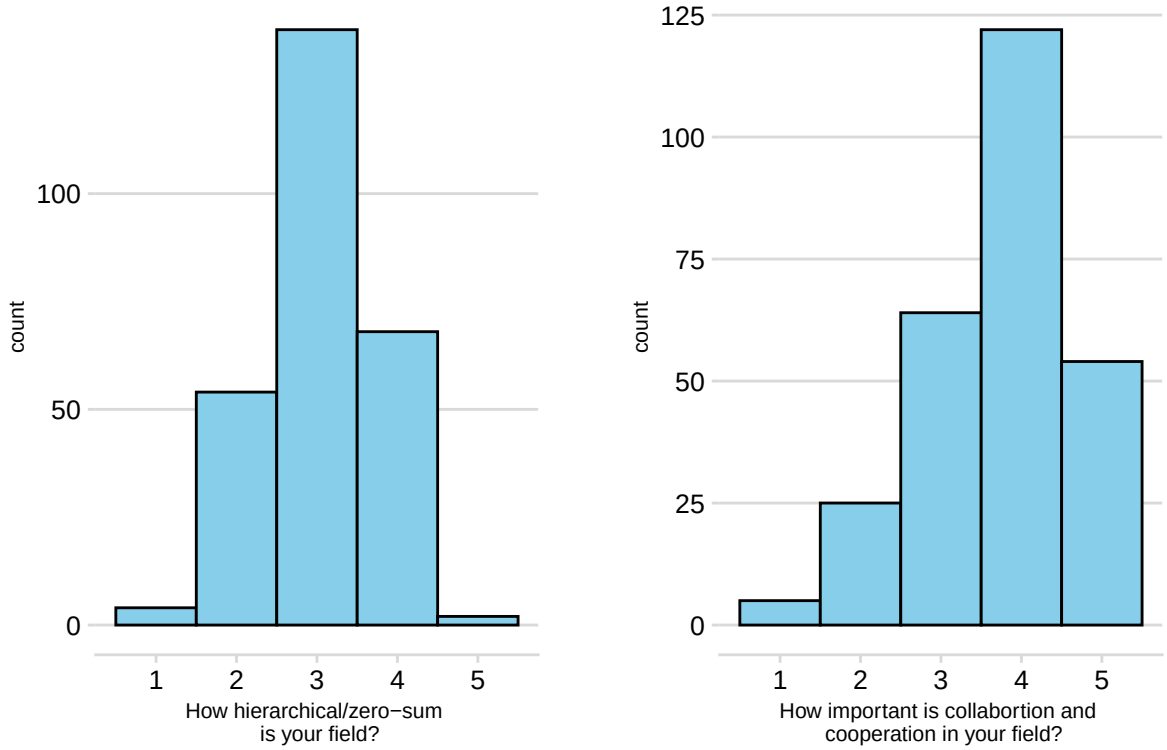
In order to succeed in (participant field) researchers must be wary of other researchers who may try to steal ideas or disrupt others' research. Success in (participant field) is a zero-sum game that inevitably has a few winners and many losers. There is a hierarchy, ranking, or pecking order in (participant field), and the people at the top have the most influence on which scholarship is valued. In (participant field), even graduate student researchers who have exciting new ideas or perspectives are able to influence which scholarship is valued. The norms and best practices in (participant field) are decided by the highest-ranking members or most prestigious researchers without much input or influence from less well-known researchers. Less well-known researchers have as much or more influence on the norms and best practices in the field of (participant field) compared to prestigious or well-known researchers. At a typical symposium or seminar talk in (participant field), graduate students and early career researchers ask as many questions as senior faculty. In (participant field), questions addressed to graduate students and early career researchers are likely to be patronizing or hostile.

The other two load onto the Cooperation/Collaboration factor (though a bit badly) *"The biggest advances and the most original ideas in (participant field) arise from people working together collaboratively" "In order to succeed in (participant field) researchers must cooperate with other researchers."*

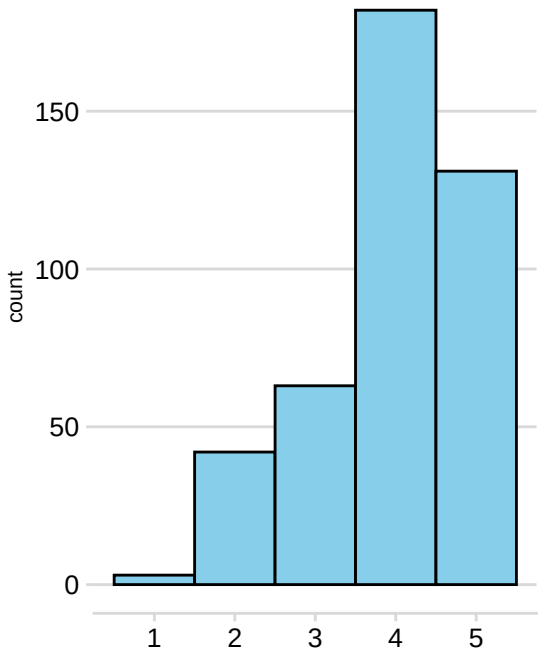
2 Study 2

2.1 Social Dynamics

2.1.1 Frequency of Answers to all questions

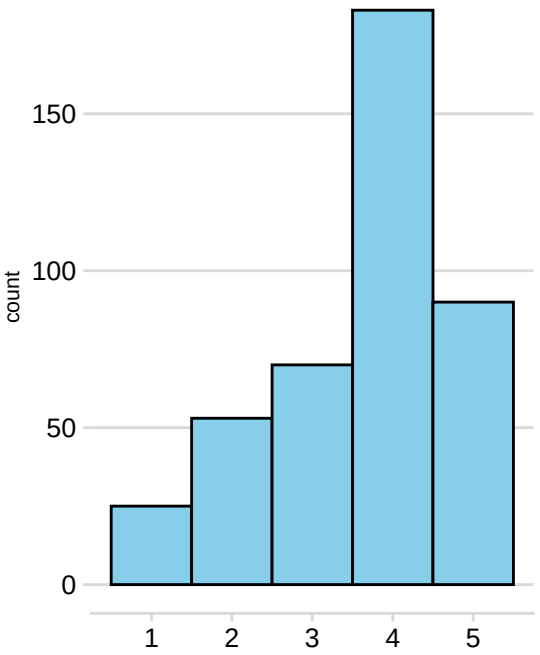


Hierarchy



There is a hierarchy, ranking, or pecking order
in (participant field), and the people at the
top have the most influence on which scholarship is valued

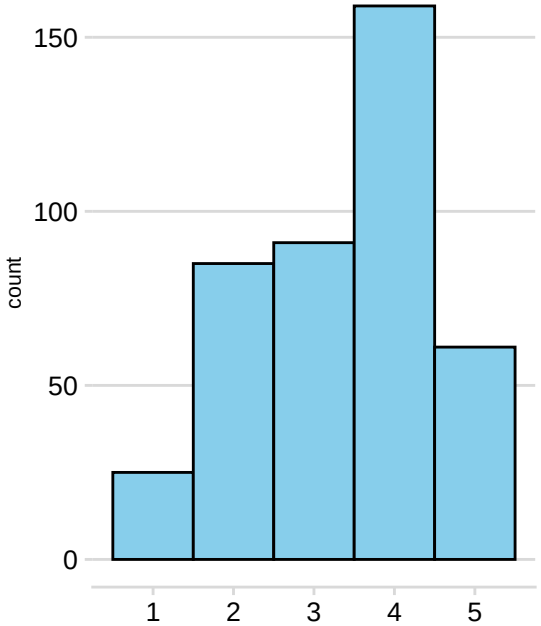
Junior



In (participant field),even graduate student researchers
who have exciting new ideas or perspectives are
able to influence which scholarship is valued.

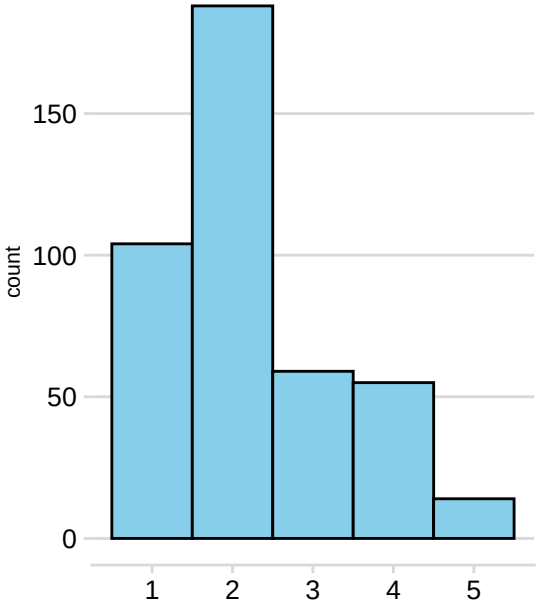
128

Norms.Prestige



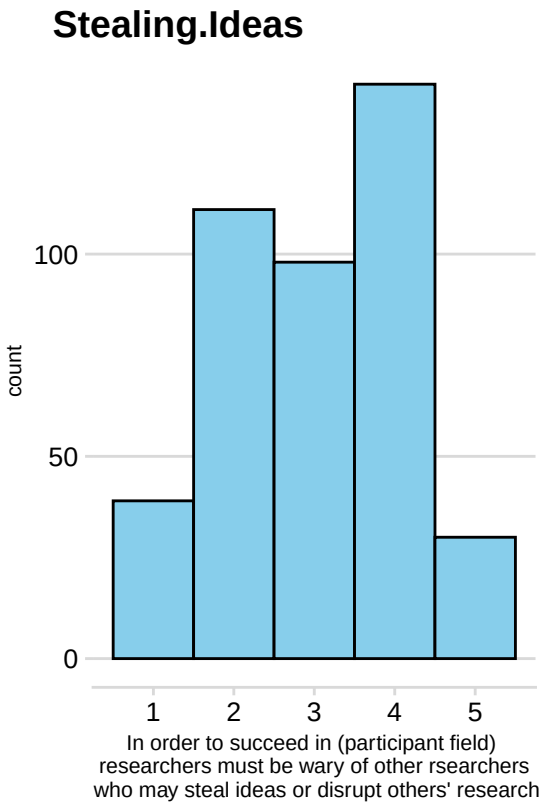
The norms and best practices in (participant field)
are decided by the highest−ranking members or most
prestigious researchers without much input or
influence from less well−known researchers.

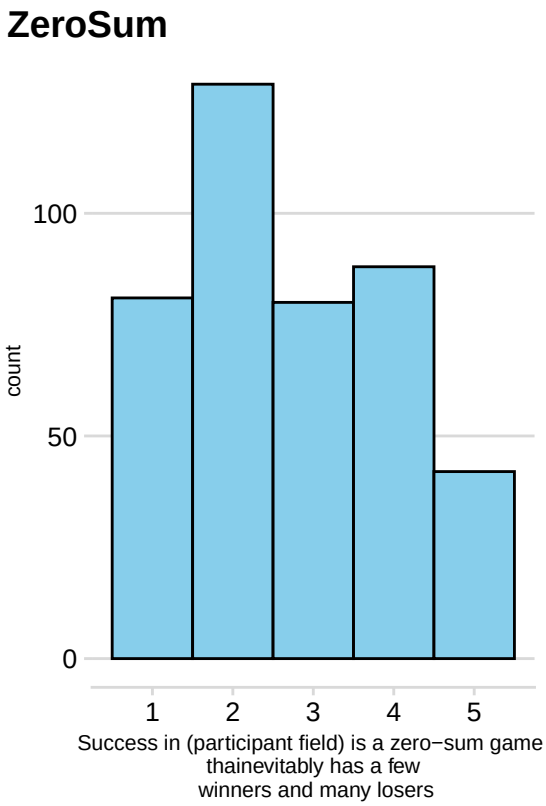
Norms.less.well.known



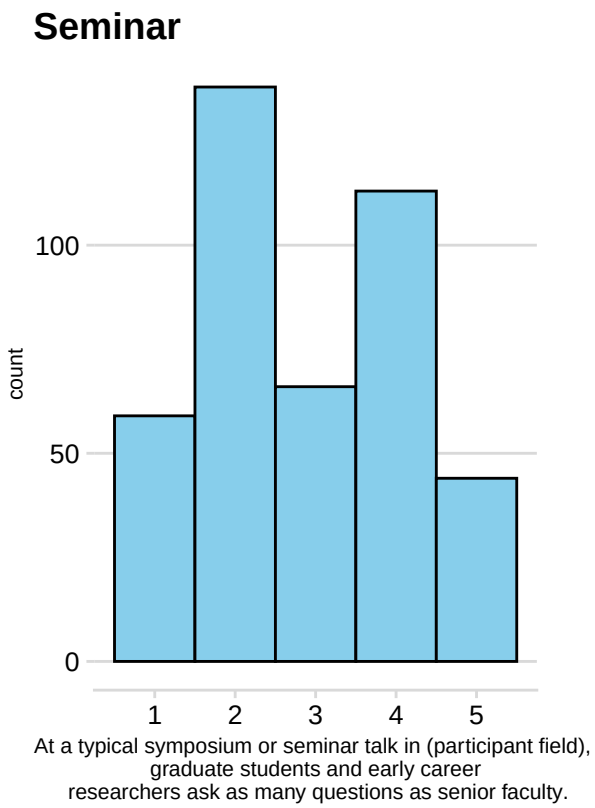
Less well−known researchers have as much
or more influence on the norms
and best practices in the field
of (participant field) compared to prestigious or
well−known researchers

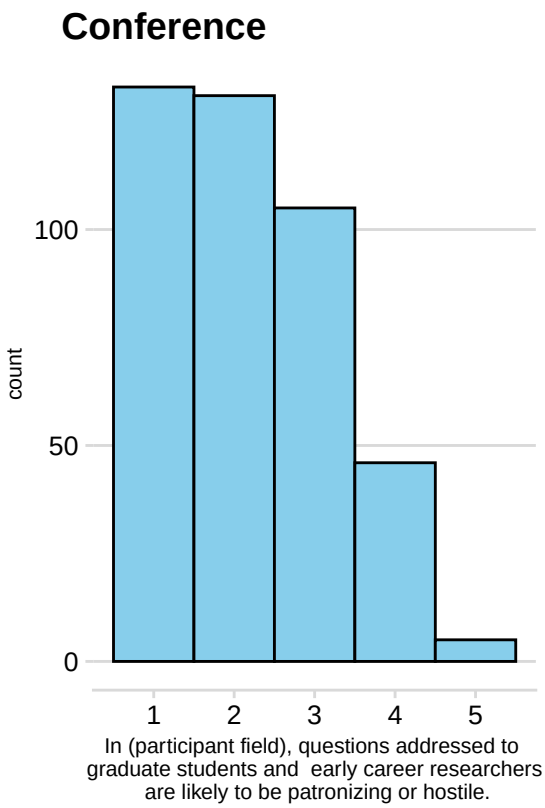
129


Stealing.Ideas
count
100
50
0
1
2
3
4
5
In order to succeed in (participant field)
researchers must be wary of other rsearchers
who may steal ideas or disrupt others' research

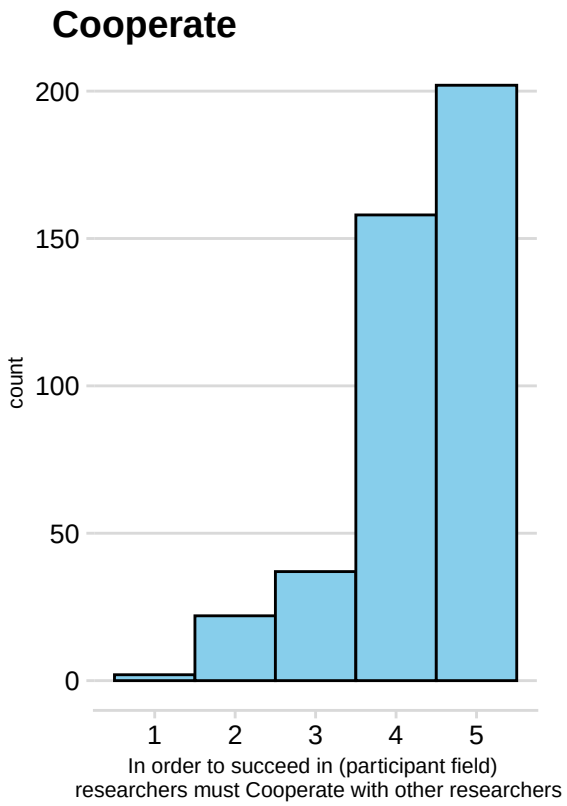

ZeroSum
count
100
50
0
1
2
3
4
5
Success in (participant field) is a zero−sum game
thainevitably has a few
winners and many losers

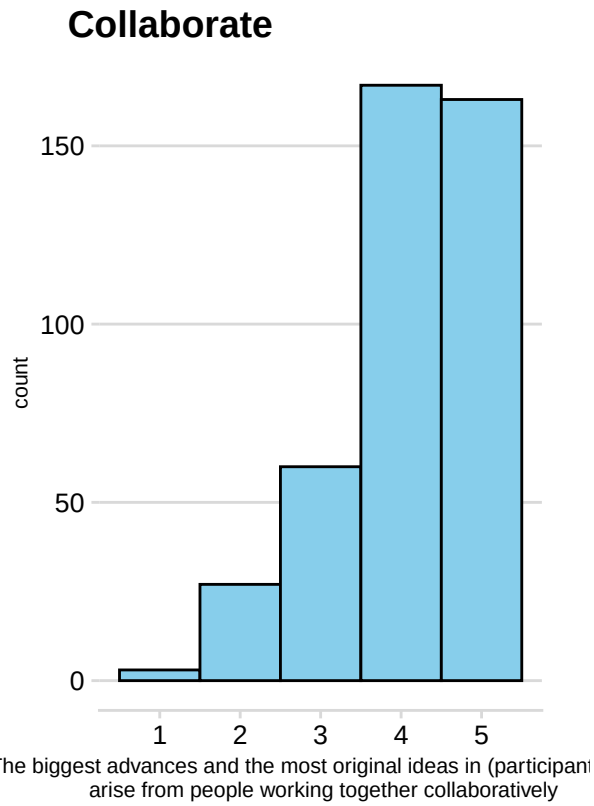
130


Seminar
count
100
50
0
1
2
3
4
5
At a typical symposium or seminar talk in (participant field),
graduate students and early career
researchers ask as many questions as senior faculty.


Conference
count
100
50
0
1
2
3
4
5
In (participant field), questions addressed to
graduate students and early career researchers
are likely to be patronizing or hostile.

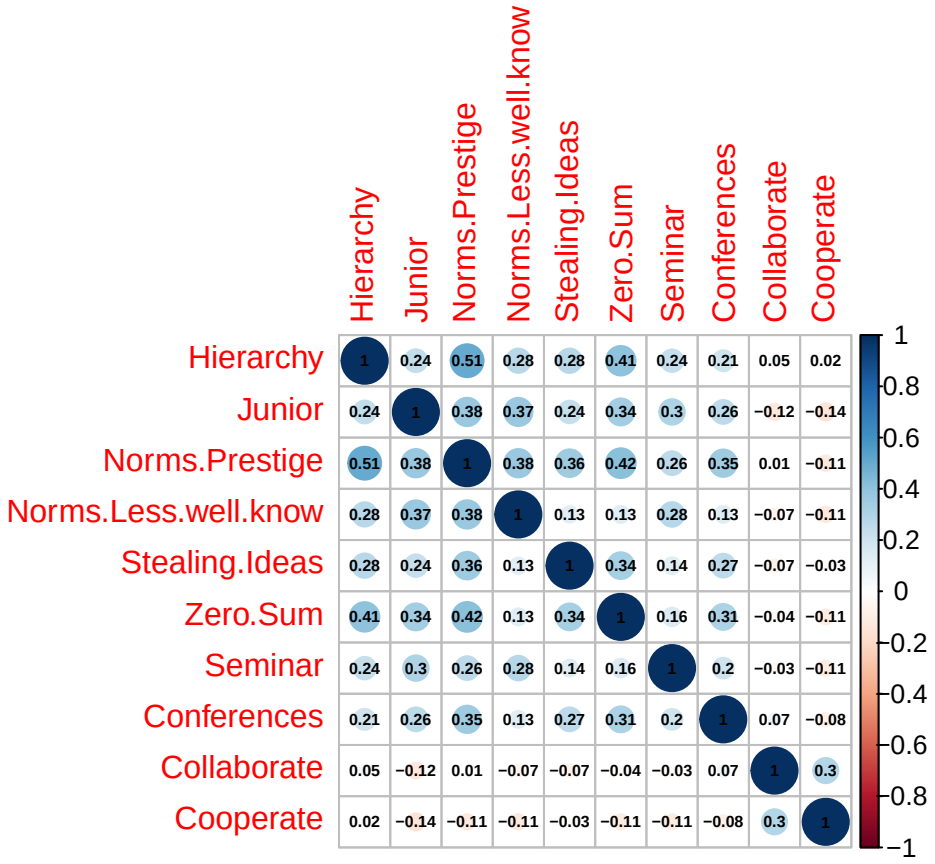
131


Cooperate
200
150
100
50
0
count
1
2
3
4
5
In order to succeed in (participant field)
researchers must Cooperate with other researchers


Collaborate
150
100
50
0
count
1
2
3
4
5
The biggest advances and the most original ideas in (participant
arise from people working together collaboratively

132

2.1.2 Correlation plot



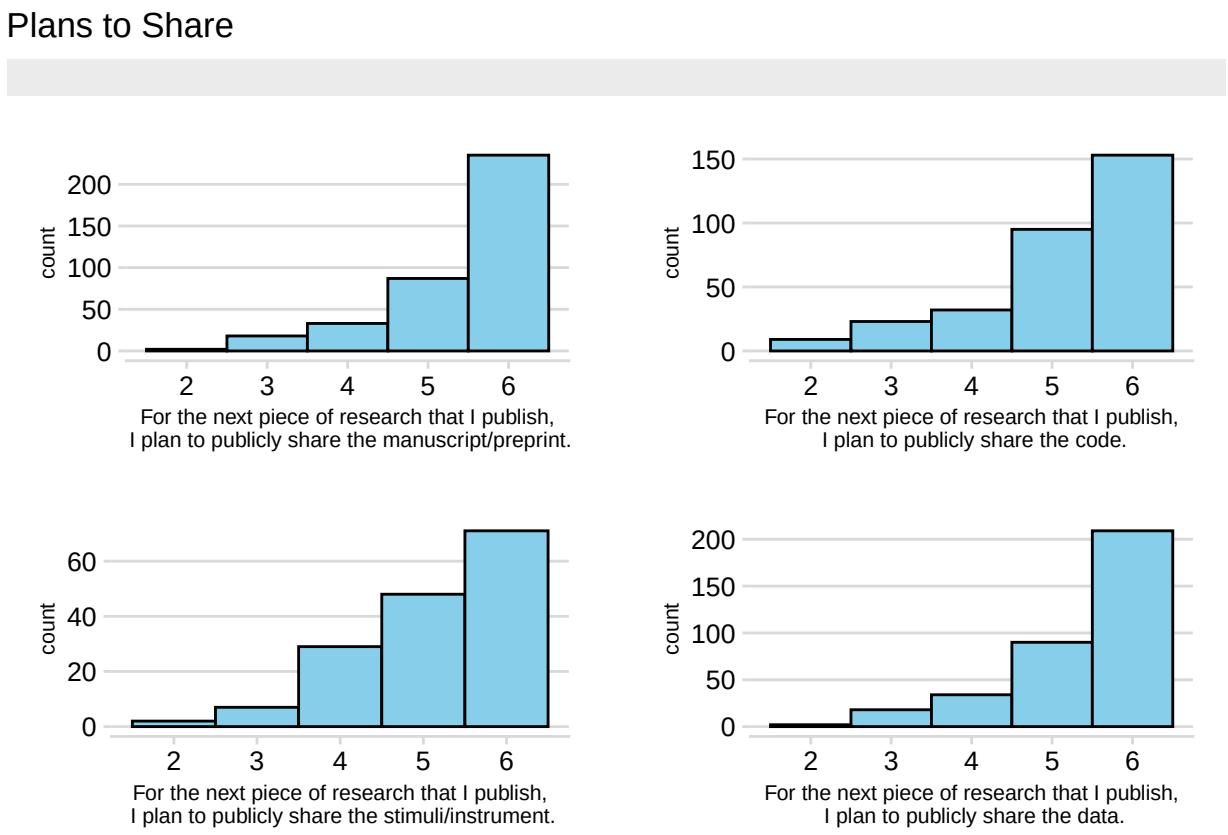
2.1.3 KMO

```
## R was not square, finding R from data
```

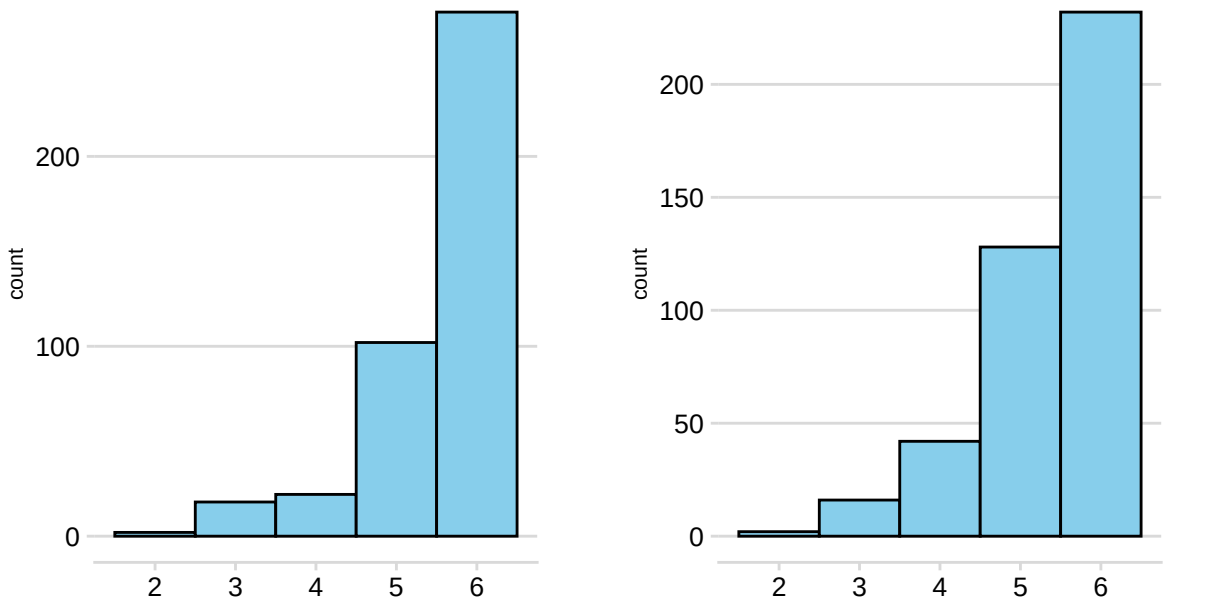
The KMO for the social dynamics questions is 0.78620404525633 which tells us whether its worth doing a factor analysis. Anything over .5, or conservatively .6 means we can do a factor analysis. Bartlett's test for sphericity also yielded a significant result (X2=719.858510871467,p=1.96317732437785e-122)

2.2 Plans to implement open science and opinions about importance

2.2.1 Frequency of Answers

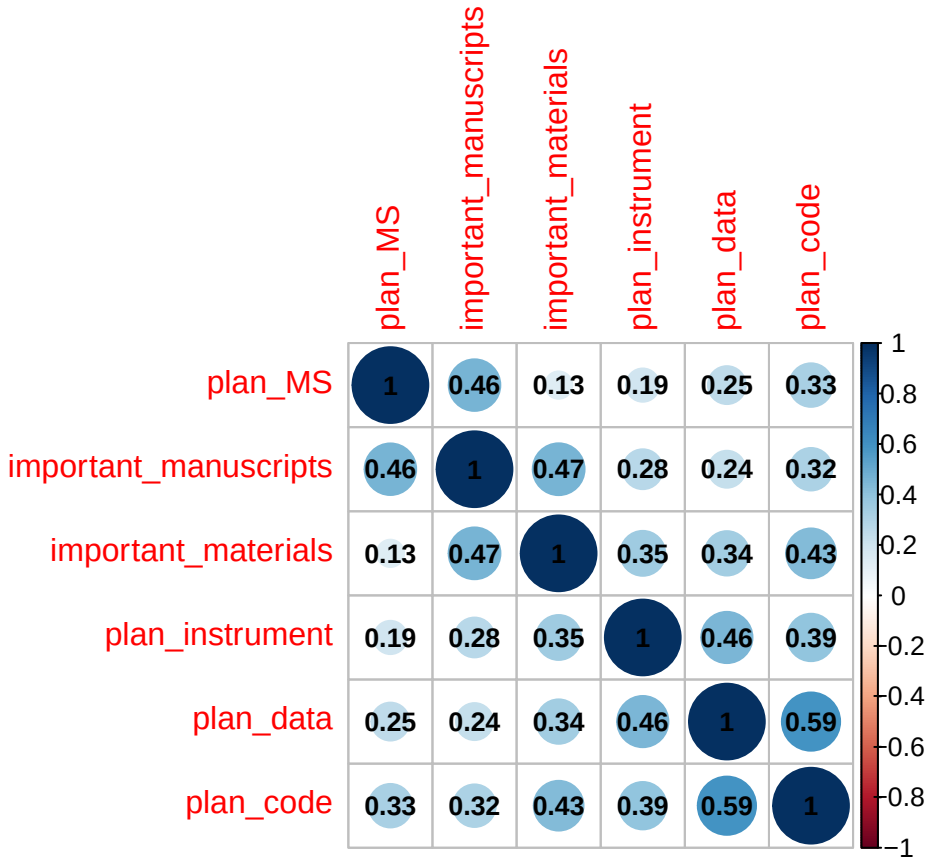


Importance of Sharing



Most people who took this survey have plans to share their manuscript and materials, and think it is important to do so. This was not a representative sample. When we analyze the representative sample we will ask whether there is an effect of population on these answers, to test whether, for example those who opt in to a survey like this are more likely to support open science.

2.2.2 Correlation plot



All items are correlated. However, there are stronger correlations within questions about materials (data, code, instrument, materials) compared to manuscripts (MS).

2.2.3 KMO

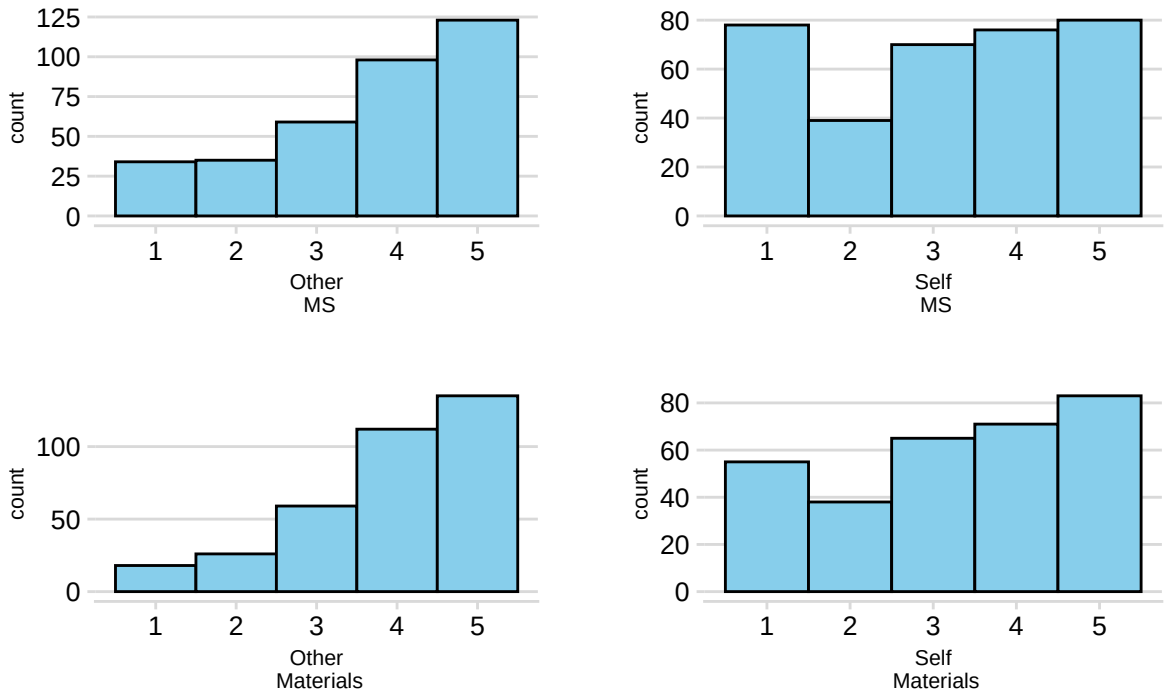
```
## R was not square, finding R from data
```

Based on the KMO and Bartlett's test, doing a factor analysis is acceptable (MSA= 0.710247938225383) Bartlett's test for sphericity also yielded a significant result (X2=224.218798197473,p=2.44195867085289e-39)

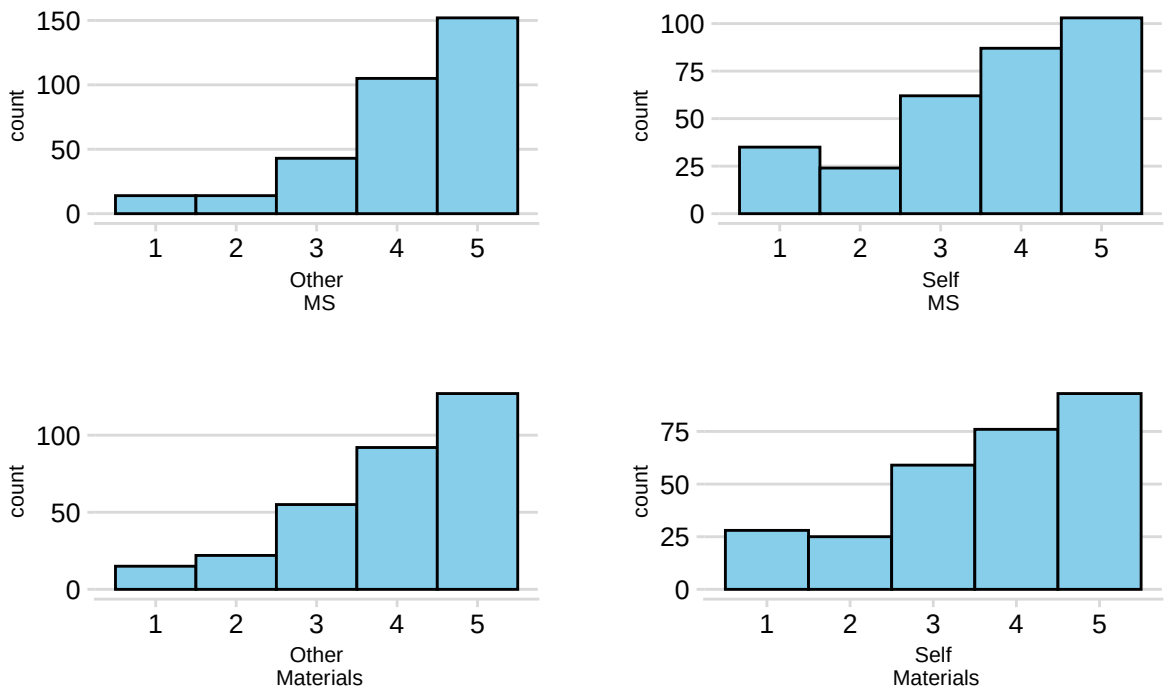
2.3 Motivations for engaging in Open Science

2.3.1 Frequency of answers to individual questions

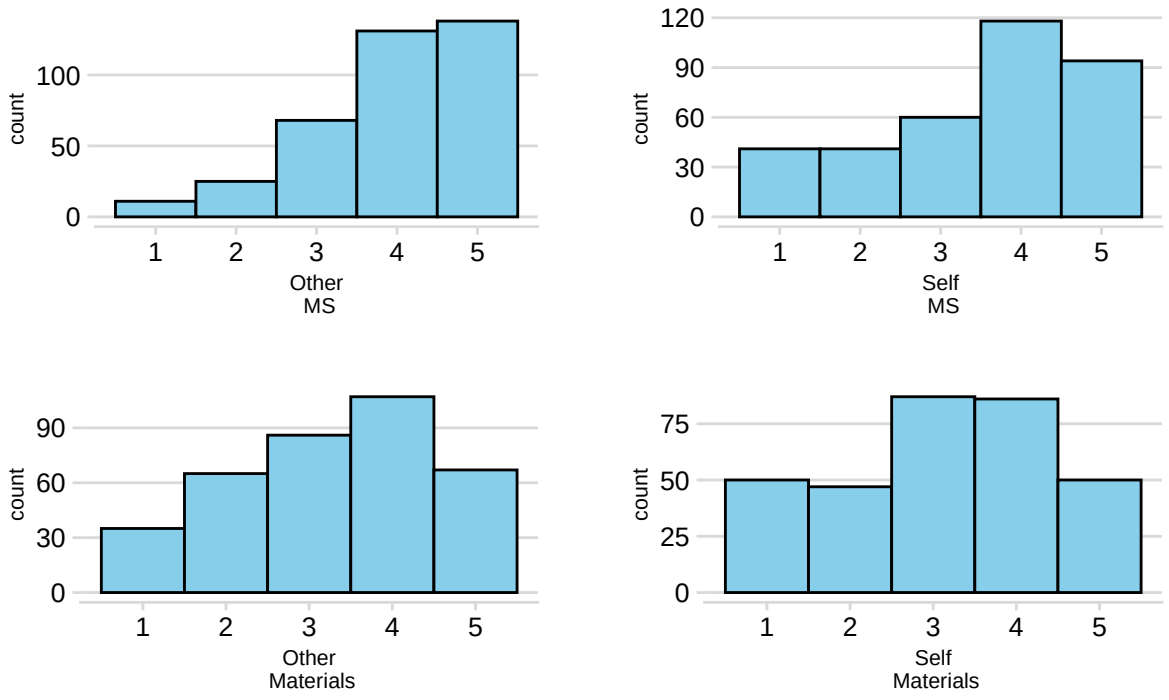
Requirements or encouragement from funders/Institution



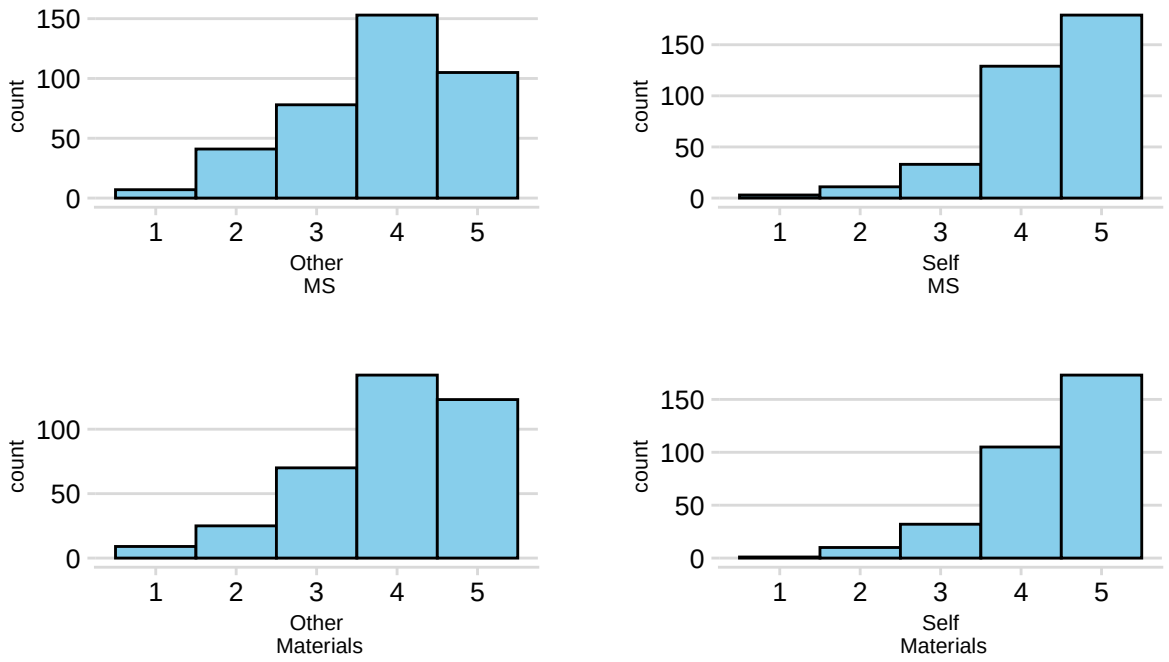
Requirements or encouragement from the P.I. of lab



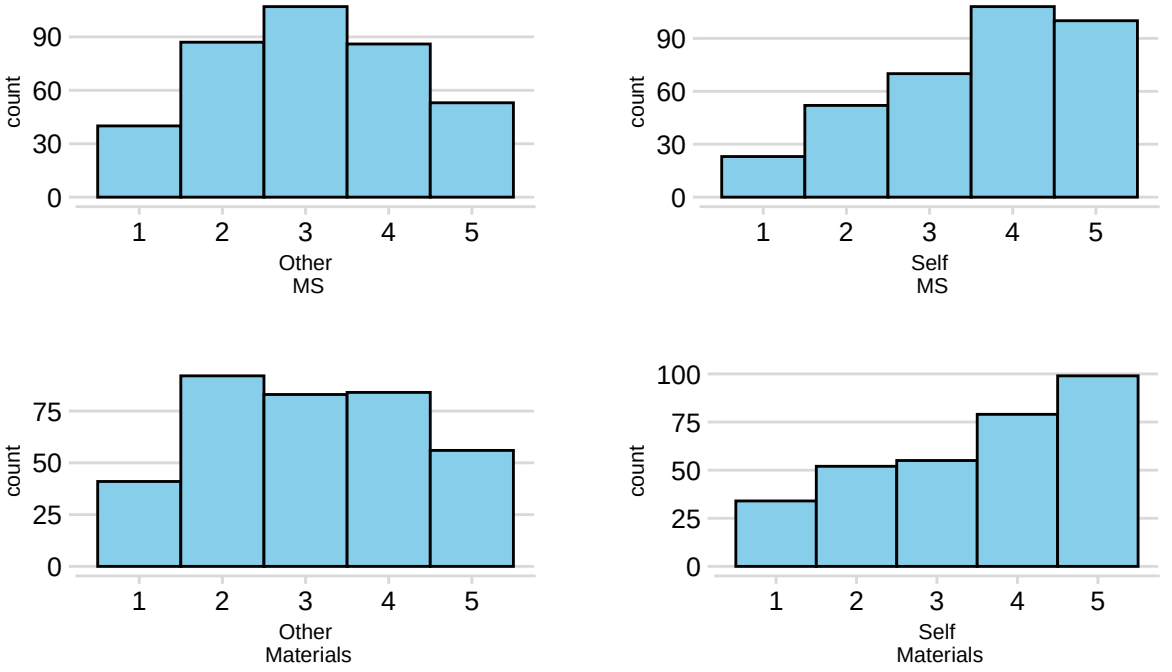
Personal benefits such as prestige or citations.



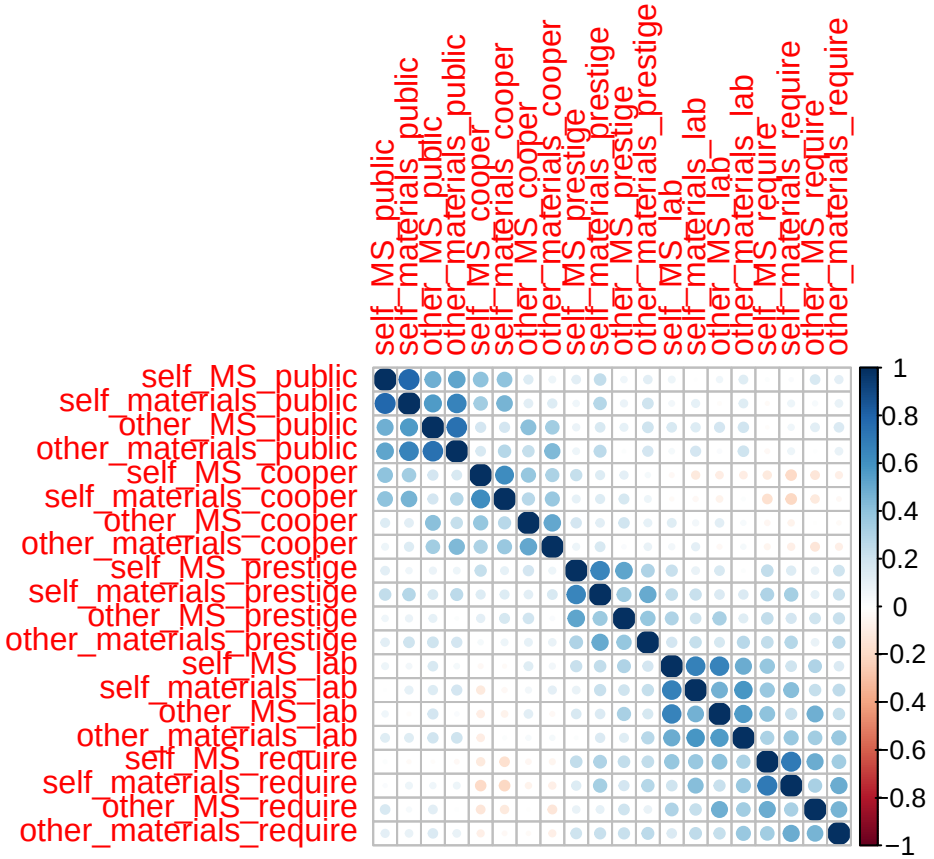
Benefits for (participant field), such as for other researchers who may be able to use the materials for their own work, or to encourage scientific progress in the field.



Benefits for the public, such as increase in public trust of science, or downstream of having reliable or reproducible science.



2.3.2 Correlation Plots



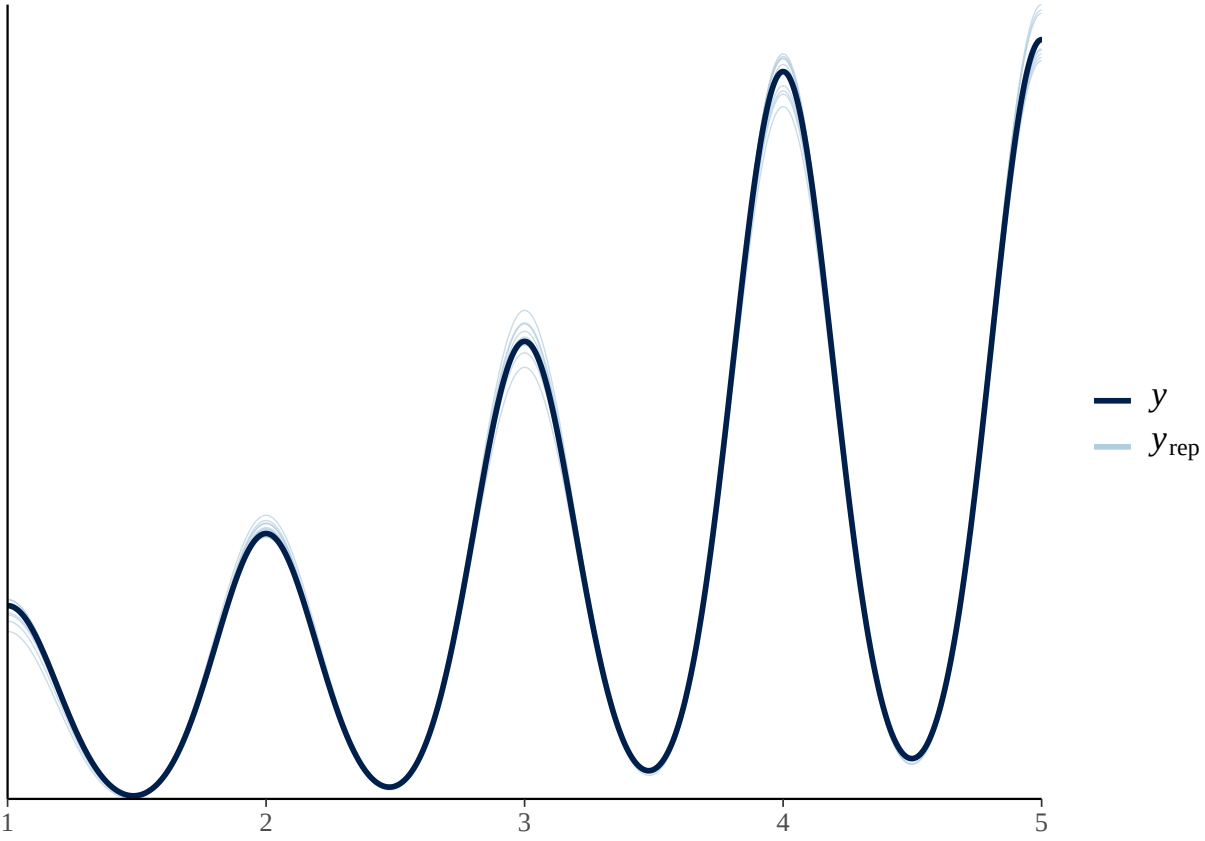
2.3.3 KMO

```
## R was not square, finding R from data
```

Based on the KMO and Bartlett's test, doing a factor analysis is acceptable (MSA= 0.710247938225383) Bartlett's test for sphericity also yielded a significant result (X2=2008.45409858217,p=1.11735492906992e-300)

2.3.4 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```



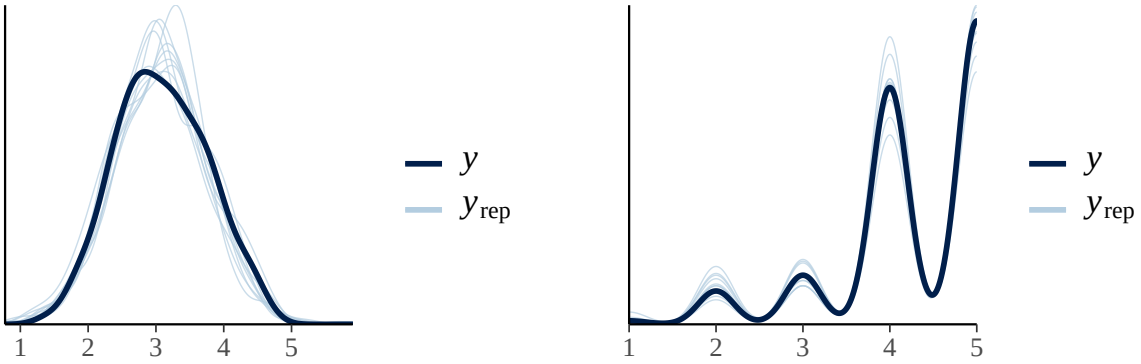
2.4 What predicts participants' perceptions of the social dynamics in their field?

2.4.1 Model: What predicts participants' perceptions of the social dynamics in their field?

We used the package brms [@bürkner2017] to ask whether there are effects of how much people identify with their field and the number of years they have been in their field on whether they see their field as hierarchical/zero-sum and whether the participants were answering about themselves or others.

2.4.2 Model Check: What predicts participants' perceptions of the social dynamics in their field?

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```

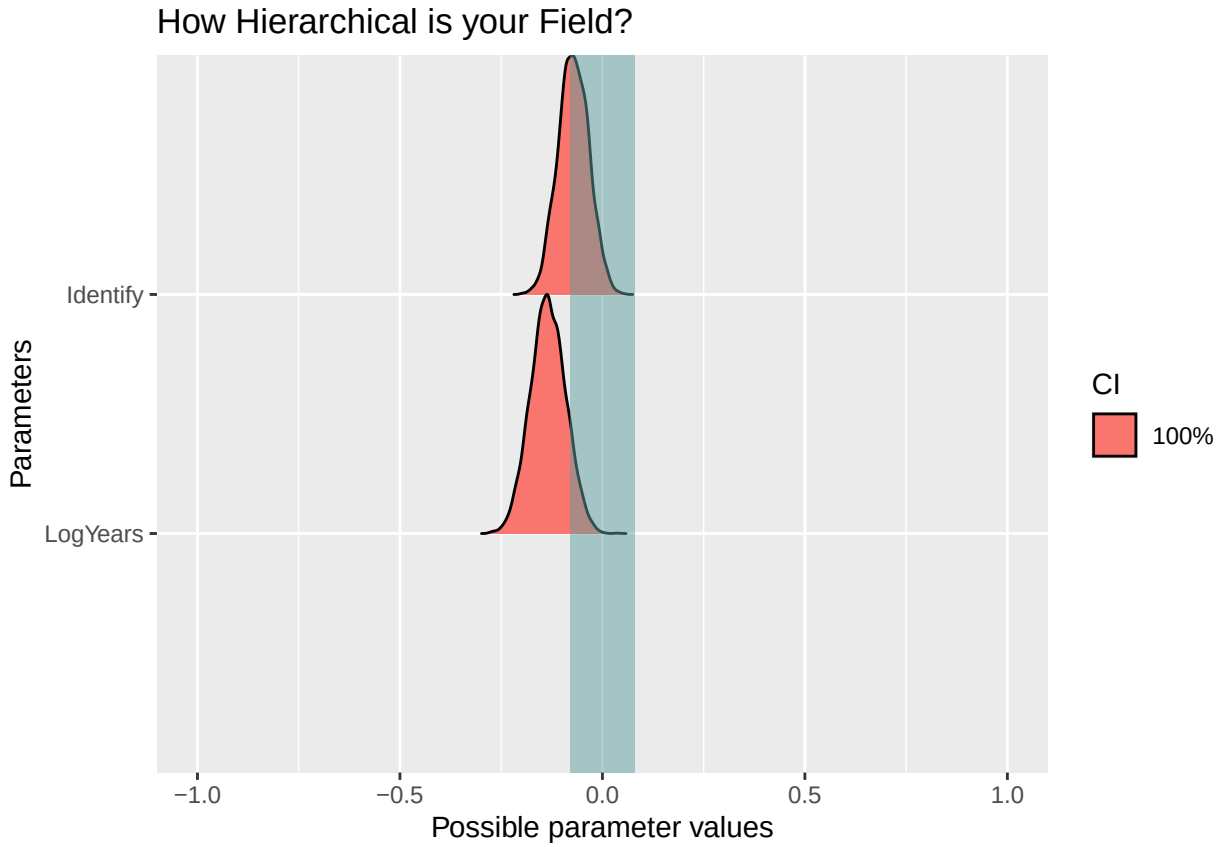


We calculated a Bayes Factor here to compare the full and null model (that does not include the number of years that a participant has been in their field). We find strong evidence that log transformed years predicts participants' score on the Hierarchical/Competitive factor (BF=4.59691501272338e-61), where academics that have been in their field longer think their field is less hierarchical. We also find that that log transformed years predicts whether you think Cooperation is important (BF=65.178607846539). we don't find evidence that identifying with your field predicts your score on the Hierarchical/Competitive questions 1.7537398638172 in favor of the null nor do we find evidence that how much you identify with your field predicts how much you think Cooperation is important (BF=0.821507403343672).

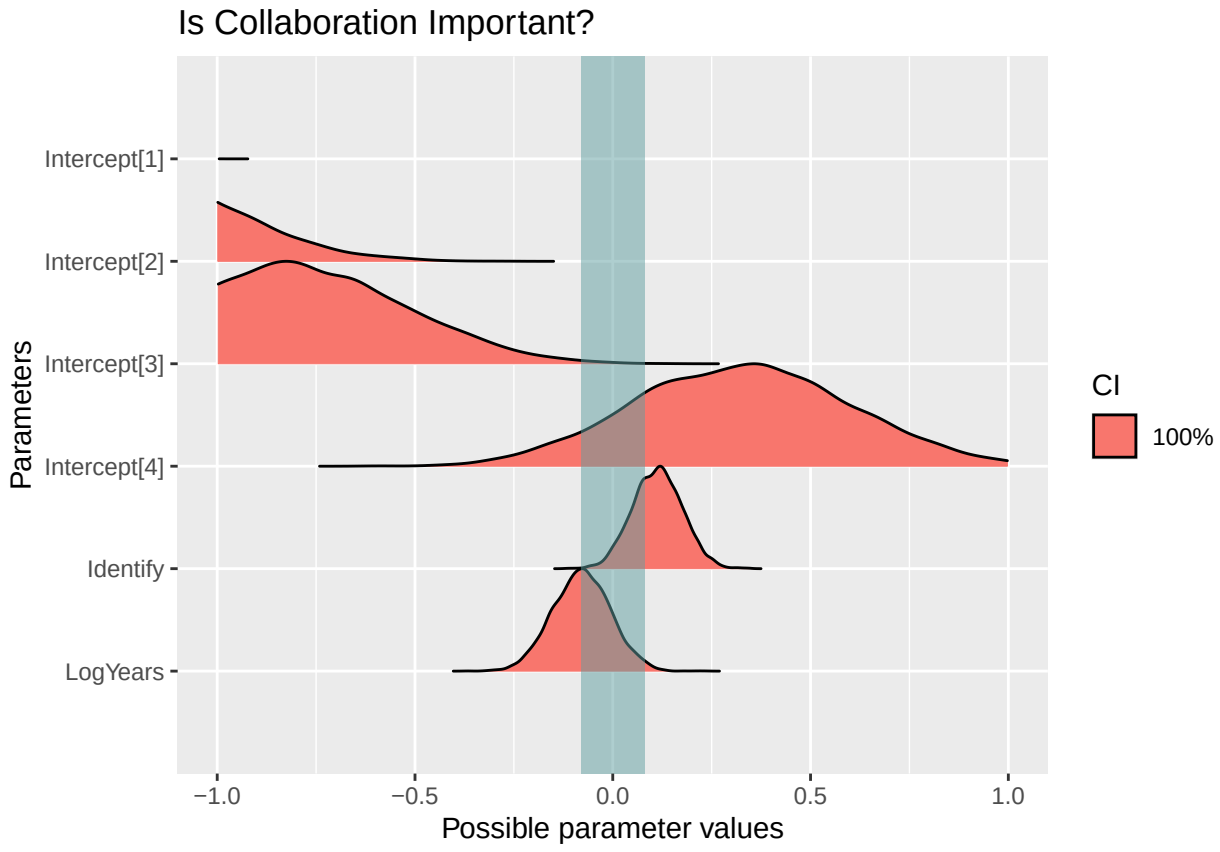
2.4.3 ROPE and pd analysis: What predicts participants' perceptions of the social dynamics in their field?

Next we will ask about effects. We will use the ROPE method to test whether the effects land within a null region, which would suggest they don't have an effect on the outcome variable.

```
## Possible multicollinearity between b_Identify and b_Intercept[2] (r = 0.76), b_Identify and b
```


How Hierarchical is your Field?
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
CI
100%

200


Is Collaboration Important?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
CI
100%

201

ROPE Percentages

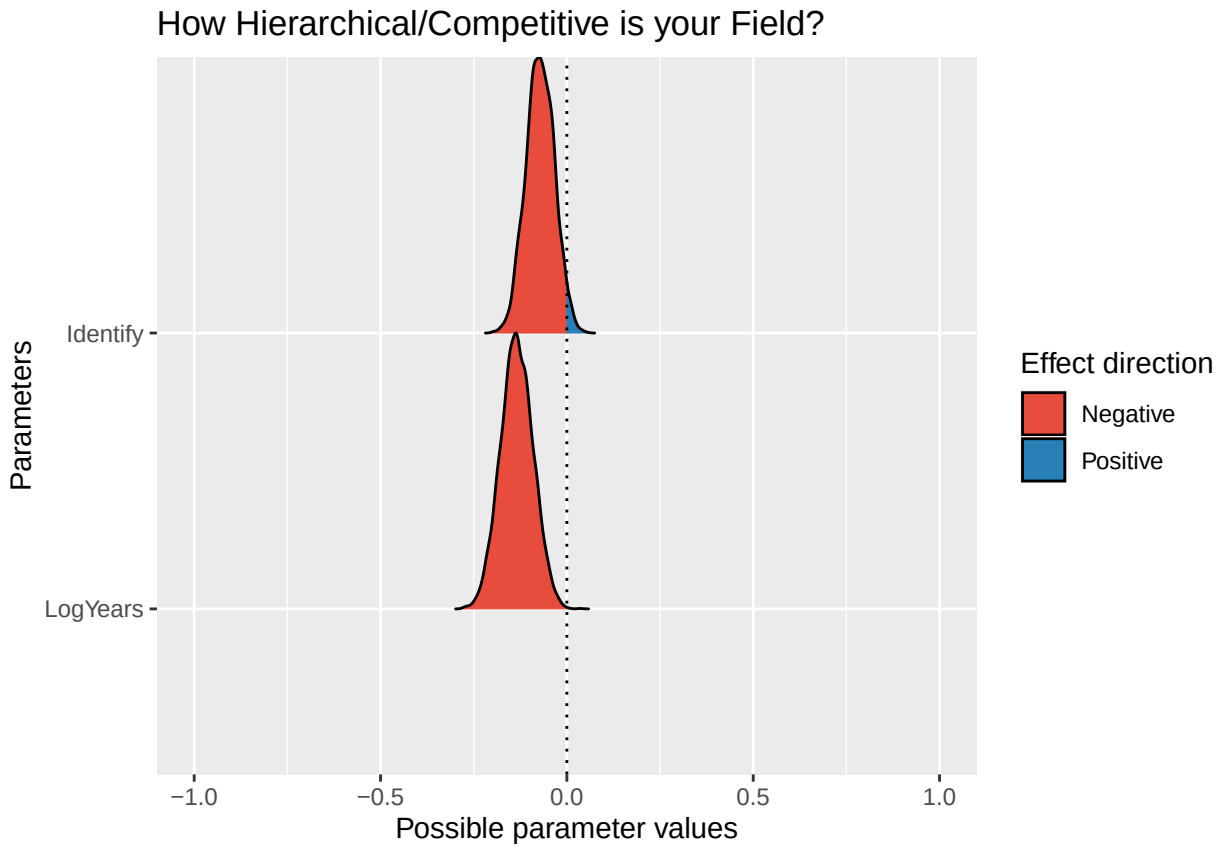
Do you plan to share your manuscript?

Parameter	ROPE_Percentage
b_Intercept	0.000
b_Identify	58.400
b_LogYears	10.925

ROPE Percentages

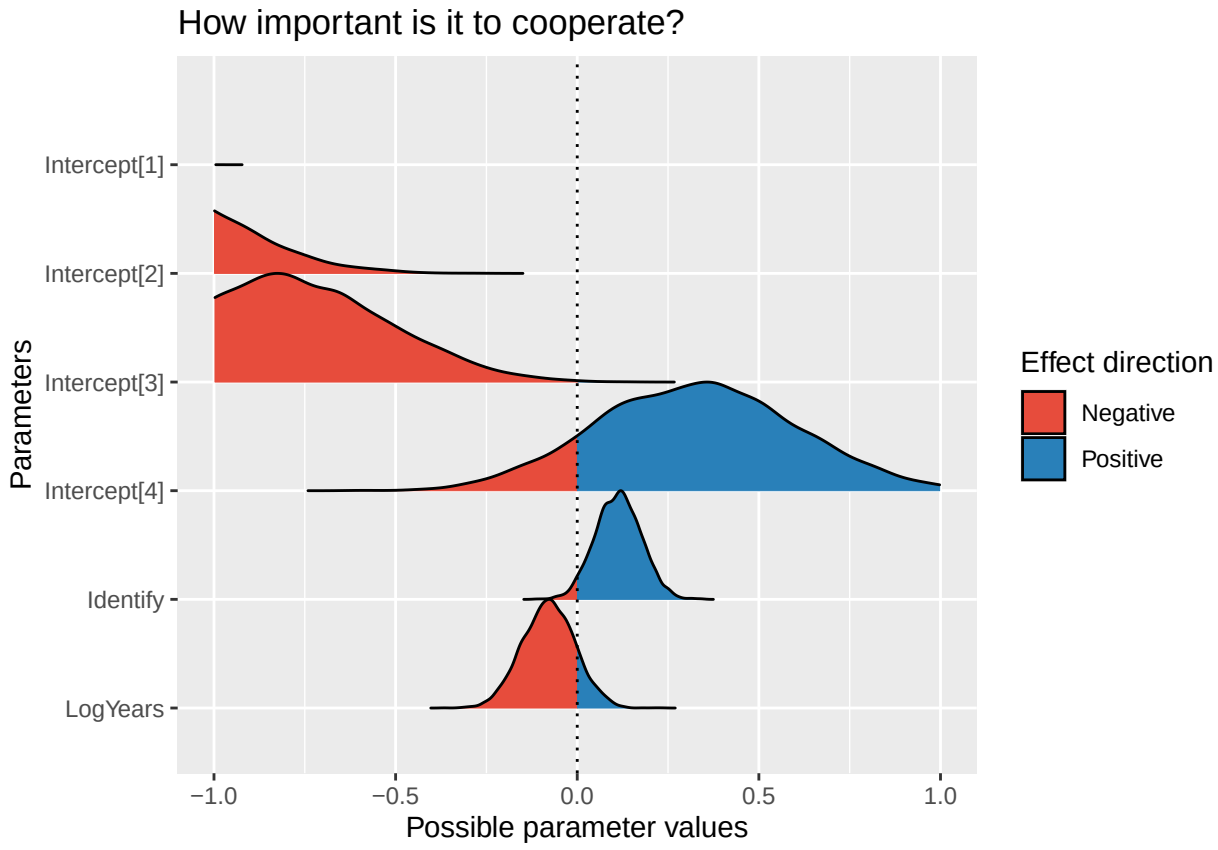
Do you plan to share your materials?

Parameter	ROPE_Percentage
b_Intercept[1]	0.000
b_Intercept[2]	0.000
b_Intercept[3]	0.250
b_Intercept[4]	11.725
b_Identify	30.325
b_LogYears	49.400




```
## Probability of Direction
##
## Parameter   |     pd
```

```
## --------------------
## (Intercept) |   100%
## Identify    | 97.30%
## LogYears    | 99.95%
```




```
## Probability of Direction
##
## Parameter    |     pd
## ---------------------
## Intercept[1] |   100%
## Intercept[2] |   100%
## Intercept[3] | 99.95%
## Intercept[4] | 88.52%
## Identify     | 96.65%
## LogYears     | 86.50%
```

This is strange – usually the outputs for the probability of direction analyses agree with ROPE. Both the Bayes Factor and the pd agree that the variables have an effect, but the ROPE analysis does not. Annoying!

2.4.4 Frequentist: What predicts participants' perceptions of the social dynamics in their field?

```
##  Family: gaussian
```

```
##   Links: mu = identity; sigma = identity
## Formula: Hierarchy_ZeroSum ~ Identify + LogYears
##    Data: TEST_data (Number of observations: 353)
##   Draws: 4 chains, each with iter = 2000; warmup = 1000; thin = 1;
##          total post-warmup draws = 4000
##
## Population-Level Effects:
##           Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## Intercept     3.66      0.16     3.35     3.97 1.00     5638     2948
## Identify     -0.07      0.04    -0.14     0.00 1.00     4429     3241
## LogYears     -0.13      0.04    -0.22    -0.05 1.00     4473     3272
##
## Family Specific Parameters:
##       Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sigma     0.67      0.03     0.62     0.72 1.00     4170     3060
##
## Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

```
## formula: Coooperatef ~ Identify + LogYears
## data:    TEST_data_S2
##
##  link  threshold nobs logLik  AIC    niter max.grad cond.H
##  logit flexible  357  -392.23 796.47 6(0)  2.19e-08 2.2e+03
##
## Coefficients:
##          Estimate Std. Error z value Pr(>|z|)
## Identify  0.20132    0.10792   1.866   0.0621 .
## LogYears -0.07525    0.12360  -0.609   0.5427
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Threshold coefficients:
##     Estimate Std. Error z value
## 1|2  -4.5524     0.8313  -5.476
## 2|3  -2.1442     0.4878  -4.396
## 3|4  -1.2052     0.4619  -2.609
## 4|5   0.7099     0.4589   1.547
## (222 observations deleted due to missingness)
```

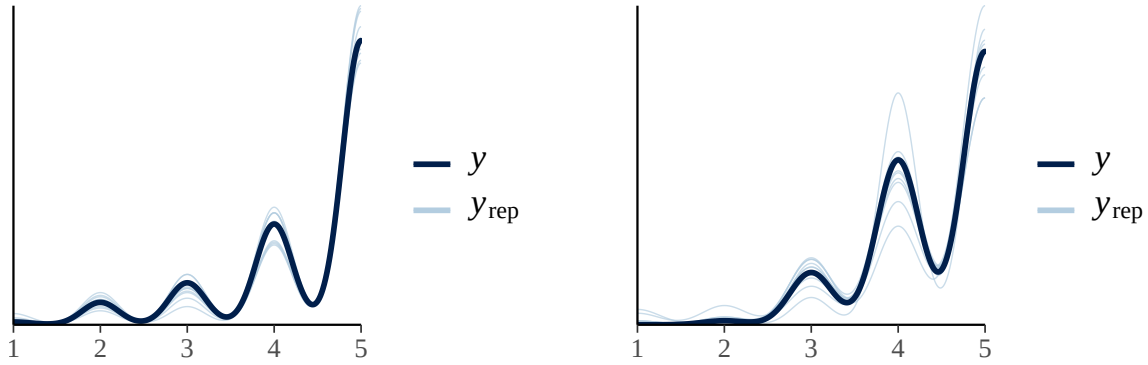
The frequentist tests show an effect of LogYears on participants' Hierarchy ratings, and a marginal effect of the extent participants Identify with their field on whether they think its important to cooperate.

2.5 Perceptions of social dynamics and open science practices attitudes

2.5.1 Plans: Do participants' ideas about social dynamics correlate with whether they plan to share their manuscript or materials?

2.5.1.1 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```



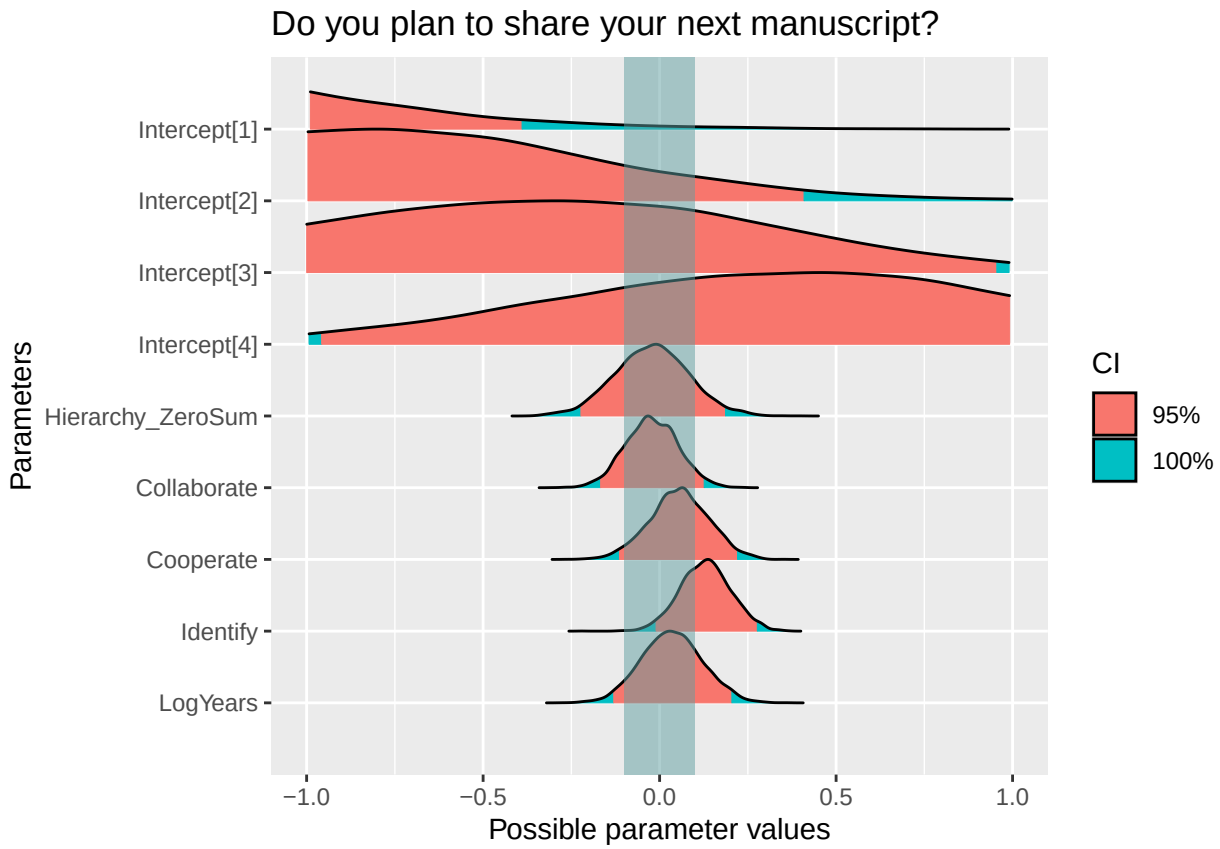
This model check looks good.

2.5.1.2 Manuscripts Next we will ask about effects. We will use the ROPE method to test whether the effects land within a null region, which would suggest they don't have an effect on the outcome variable.

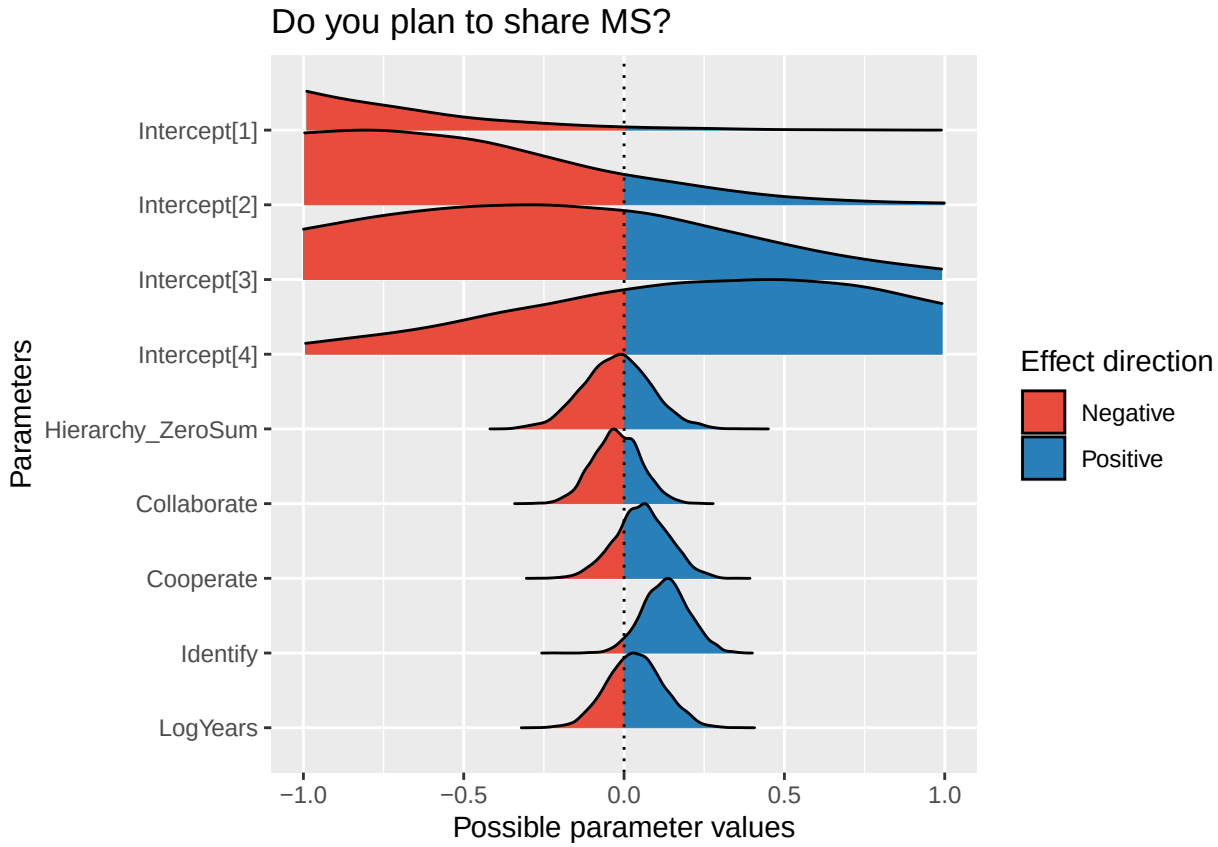
ROPE Percentages

Do you plan to share your next manuscript?

Parameter	ROPE_Percentage
b_Intercept[1]	0.450
b_Intercept[2]	4.550
b_Intercept[3]	10.475
b_Intercept[4]	10.050
b_Hierarchy_ZeroSum	65.625
b_Collaborate	79.875
b_Cooperate	66.725
b_Identify	34.125
b_LogYears	72.100




```
## Probability of Direction
##
## Parameter          |     pd
## --------------------------
## Intercept[1]       | 99.33%
## Intercept[2]       | 91.20%
## Intercept[3]       | 69.35%
## Intercept[4]       | 70.20%
## Hierarchy_ZeroSum | 58.58%
## Collaborate        | 61.58%
## Cooperate          | 75.50%
## Identify           | 96.47%
## LogYears           | 65.22%
```



These analyses suggests a small amount of evidence that how strongly someone identifies with the field affects whether they plan to share their manuscript.

2.5.1.3 Materials

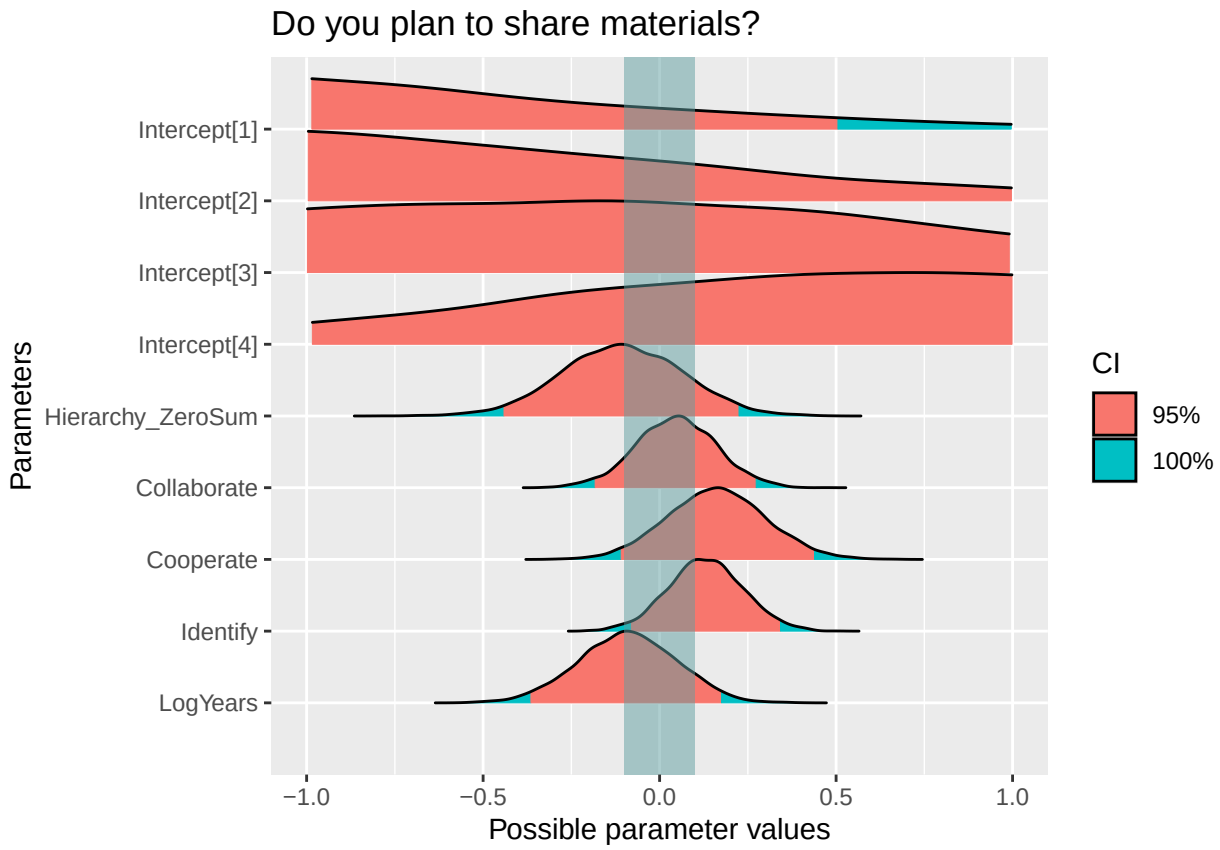
```
## Possible multicollinearity between b_Hierarchy_ZeroSum and b_Intercept[2] (r = 0.73), b_Hiera
```

ROPE Percentages

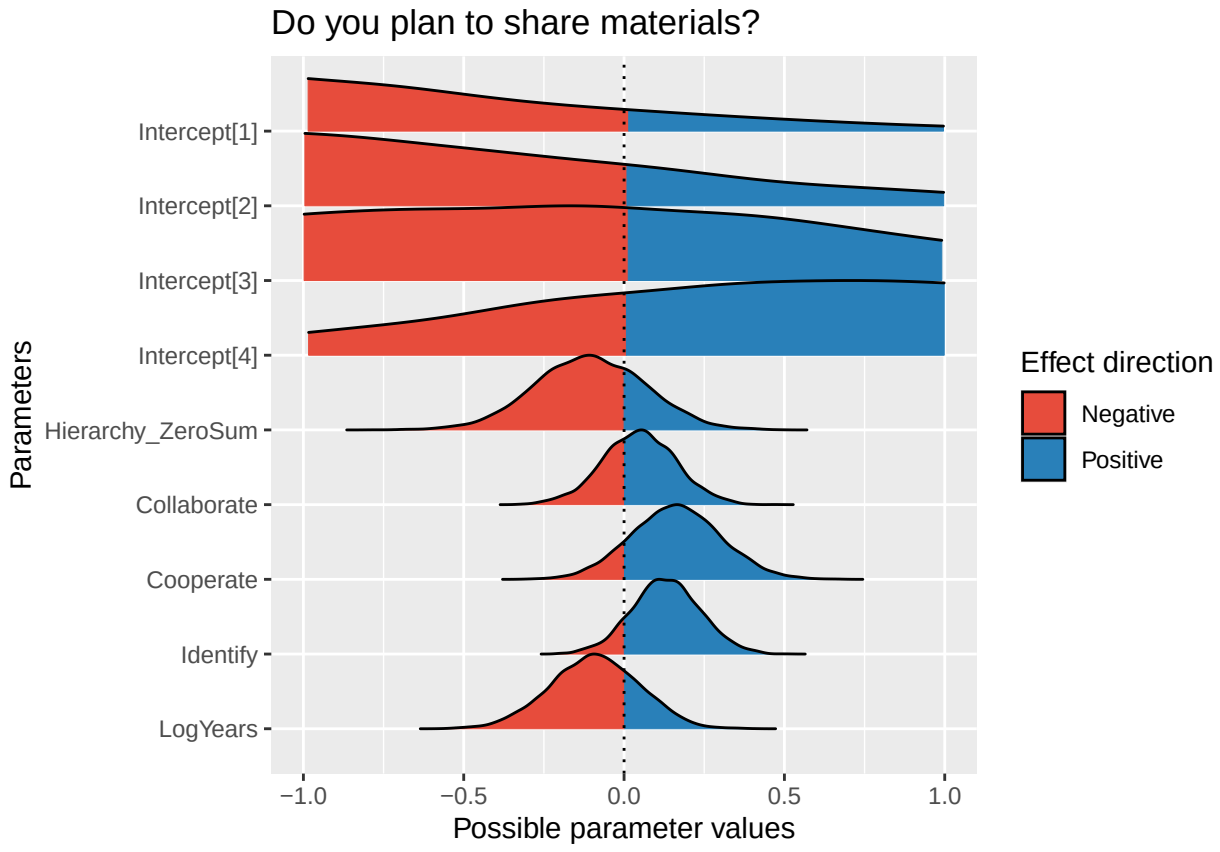
Do you plan to share materials?

Parameter	ROPE_Percentage
b_Intercept[1]	2.025
b_Intercept[2]	3.700
b_Intercept[3]	6.650
b_Intercept[4]	5.675
b_Hierarchy_ZeroSum	37.325
b_Collaborate	58.400
b_Cooperate	29.725
b_Identify	37.150
b_LogYears	43.950

```
## Possible multicollinearity between b_Hierarchy_ZeroSum and b_Intercept[2] (r = 0.73), b_Hiera
```


Do you plan to share materials?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
Collaborate
Cooperate
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
CI
95%
100%

299


Do you plan to share materials?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
Collaborate
Cooperate
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
Effect direction
Negative
Positive

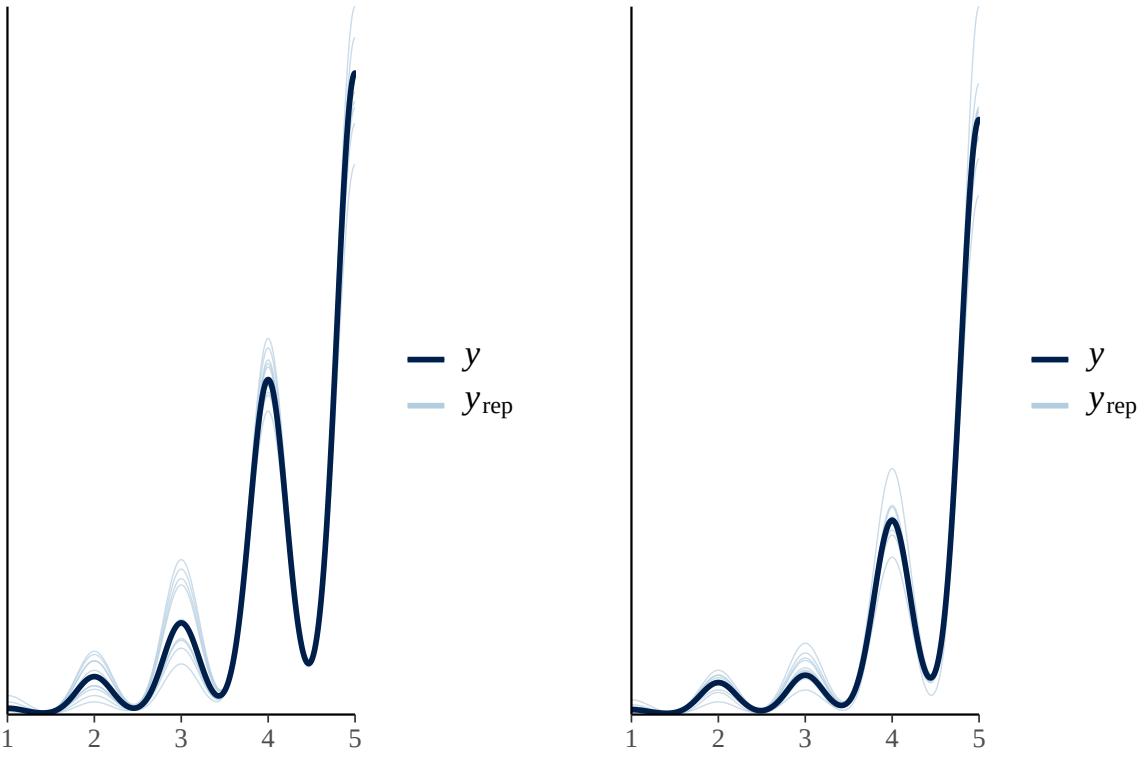
300

However none of the other factors influences participants' plans to share materials. Now we will ask whether participants' perception of social dynamics affects their views about whether its important to share manuscripts and materials.

2.5.2 Importance: Do participants' ideas about social dynamics correlate with whether they think its important to share manuscript or materials?

2.5.3 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```



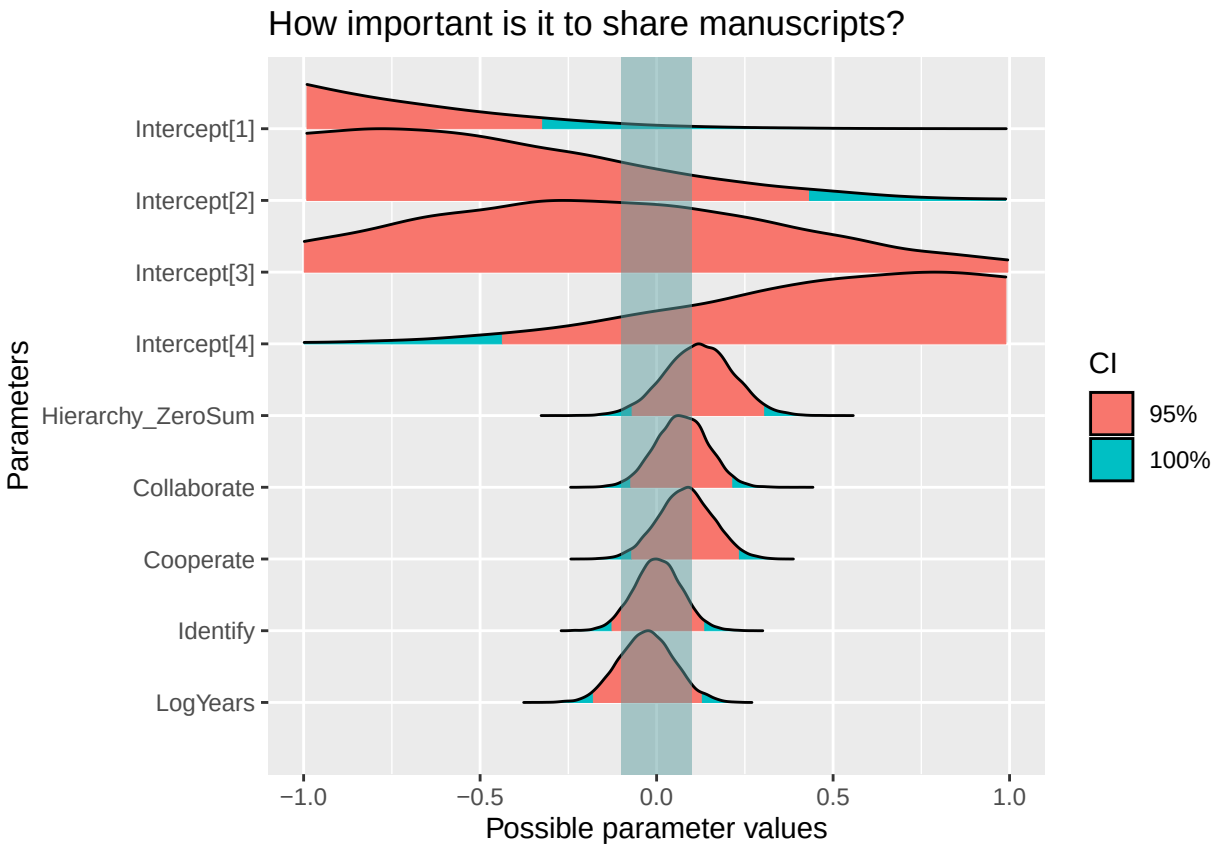
2.5.3.1 Manuscripts

ROPE Percentages

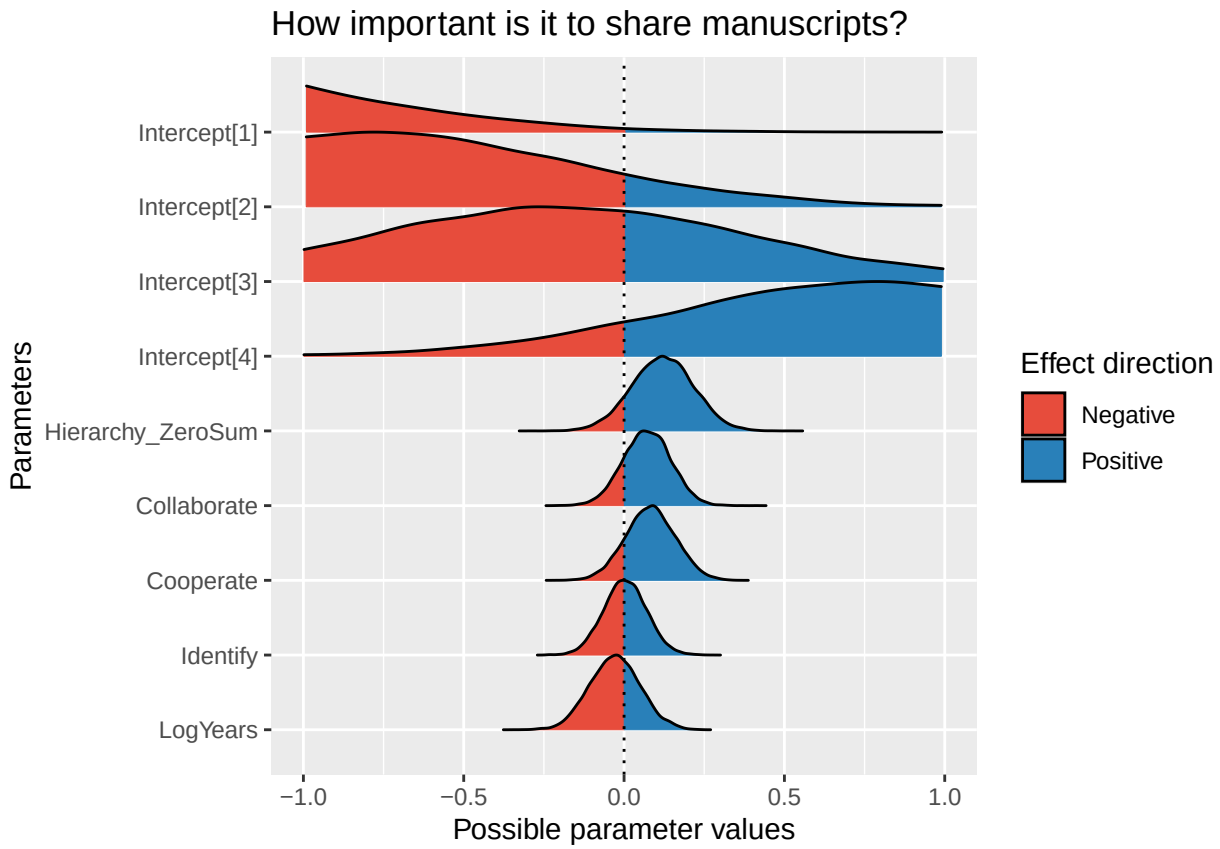
How important is it to share manuscripts?

Parameter	ROPE_Percentage
b_Intercept[1]	0.5833333
b_Intercept[2]	5.6083333
b_Intercept[3]	12.3583333
b_Intercept[4]	5.9083333
b_Hierarchy_ZeroSum	40.3250000
b_Collaborate	63.4000000

b_Cooperate	58.5416667
b_Identify	86.3000000
b_LogYears	76.6666667



311



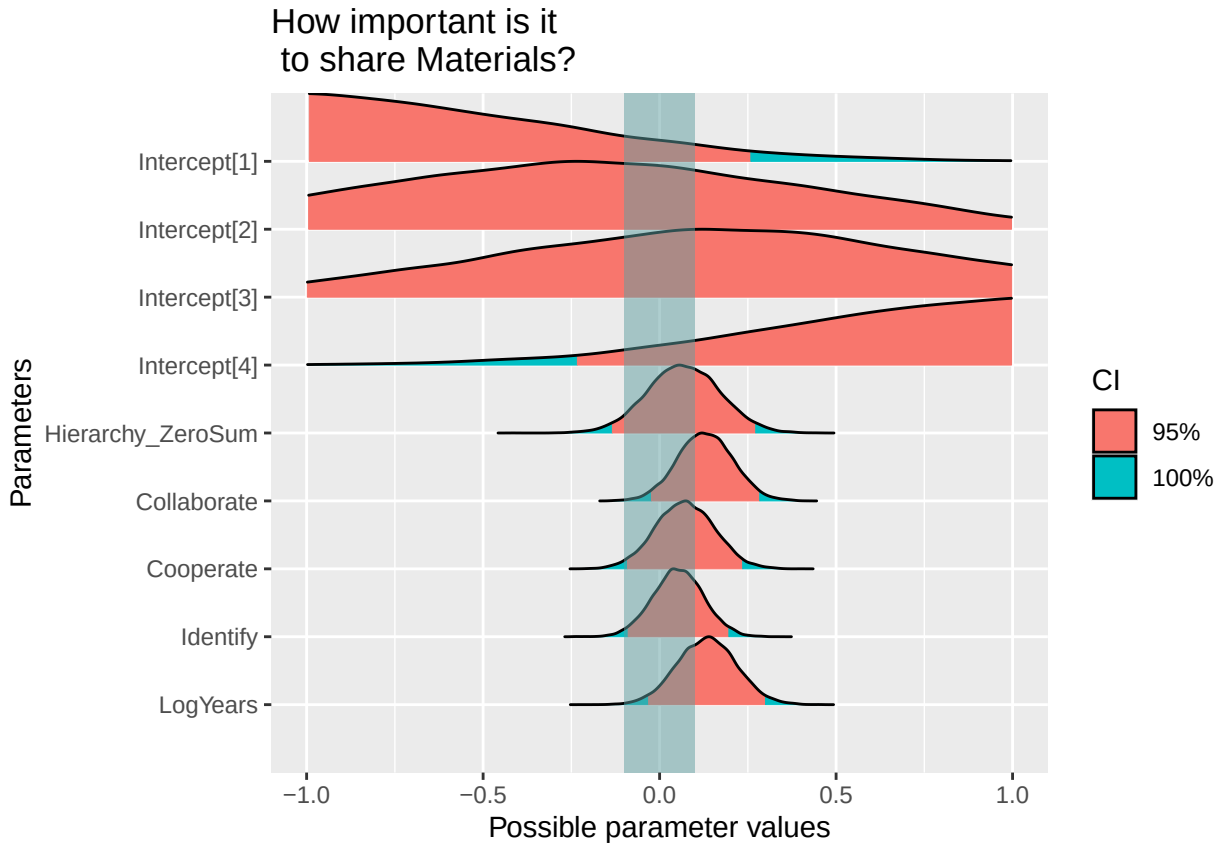
These analyses suggest that none of the factors correlated with participants' answers on whether it was important to share manuscripts.

2.5.3.2 Materials

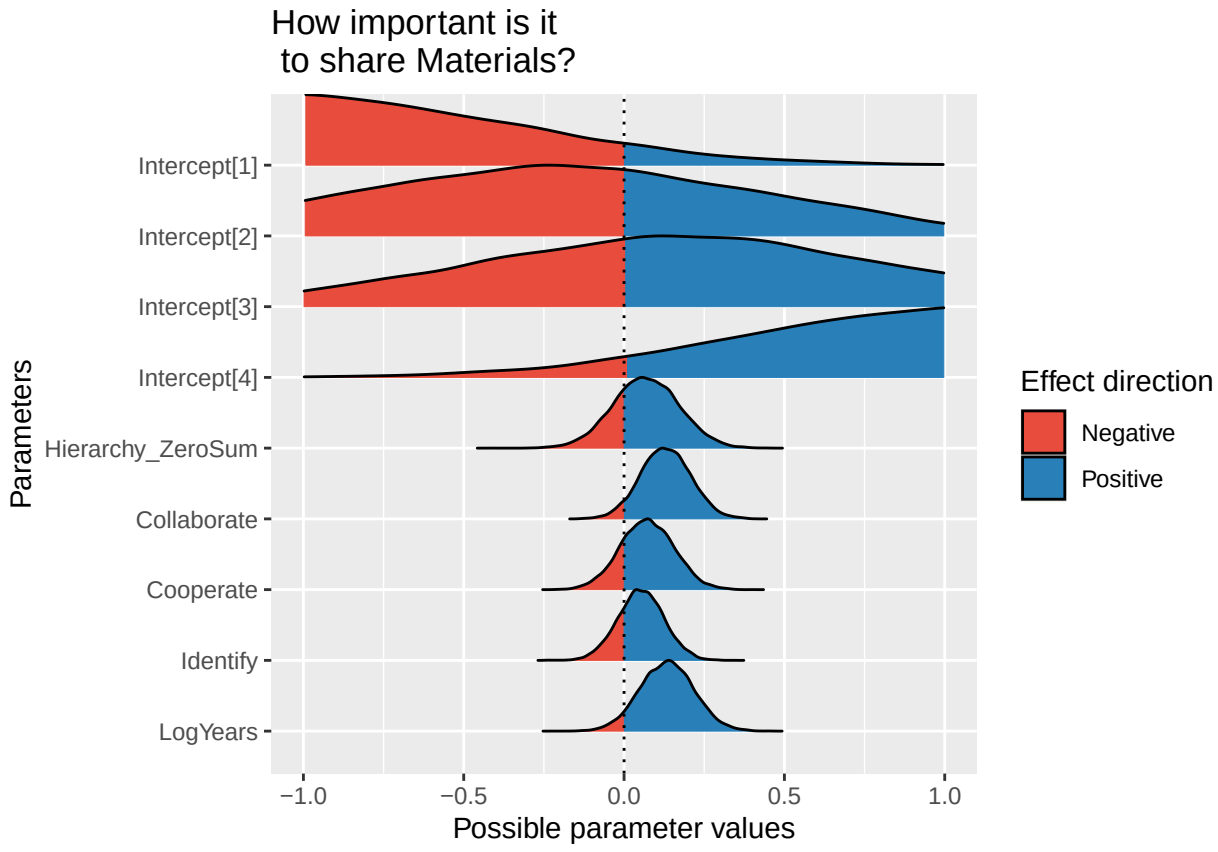
ROPE Percentages

How important is it to share Materials?

Parameter	ROPE_Percentage
b_Intercept[1]	3.558333
b_Intercept[2]	11.633333
b_Intercept[3]	11.900000
b_Intercept[4]	3.525000
b_Hierarchy_ZeroSum	57.075000
b_Collaborate	35.525000
b_Cooperate	61.183333
b_Identify	72.716667
b_LogYears	34.350000


How important is it
to share Materials?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
Collaborate
Cooperate
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
CI
95%
100%

316


How important is it
to share Materials?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
Collaborate
Cooperate
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
Effect direction
Negative
Positive

317

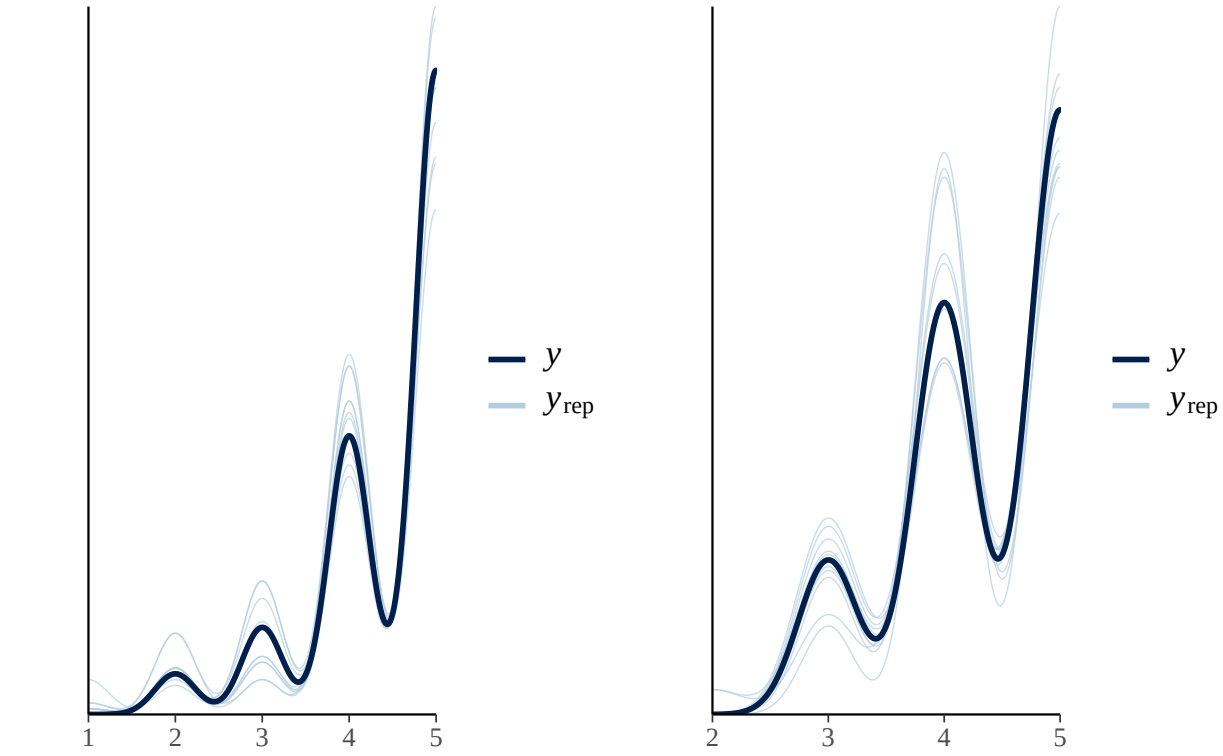
Likewise, none of the factors correlated with participants' answers on whether it was important to share materials.

2.6 Motivations and open science practices/attitudes

2.6.1 Plans: Do participants' ideas about motivations correlate with whether they plan to share manuscript or materials?

2.6.1.1 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```



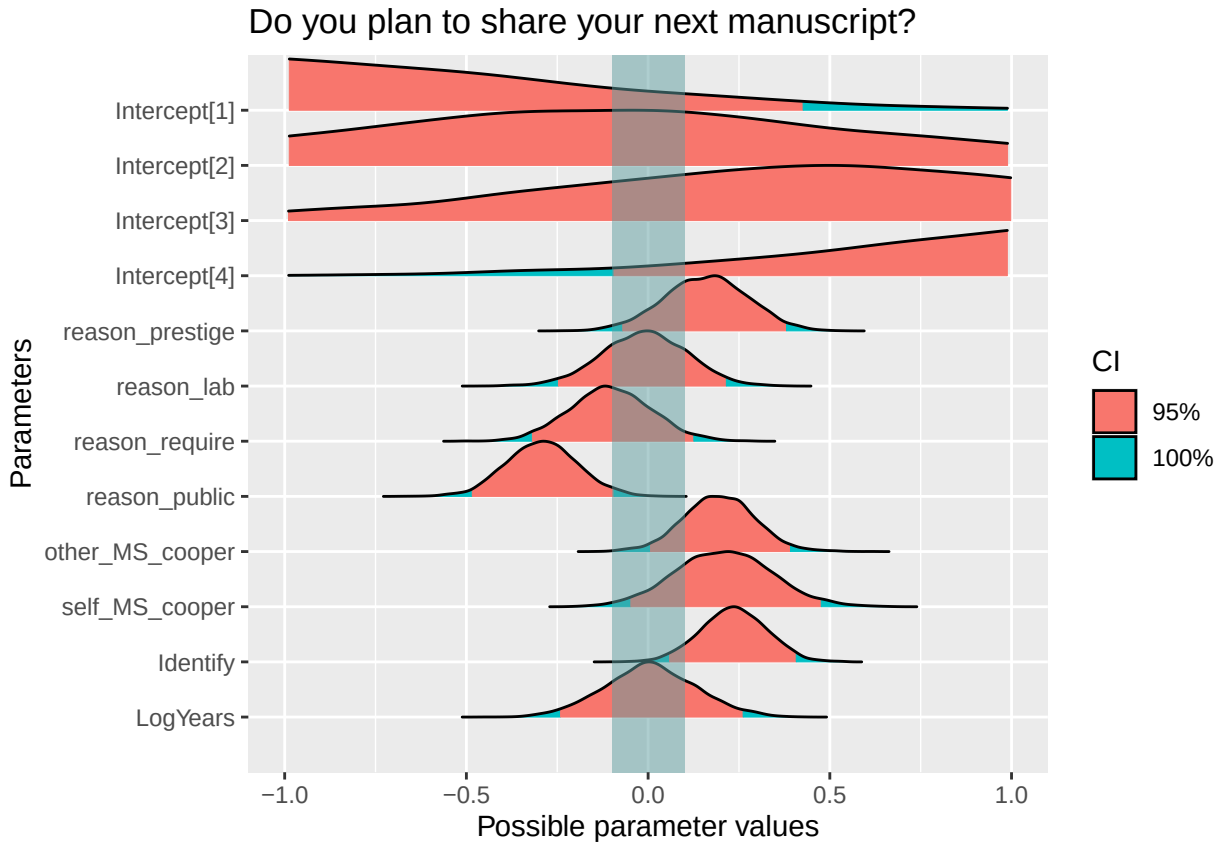
2.6.1.2 Manuscripts

ROPE Percentages

Do you plan to share your next manuscript?

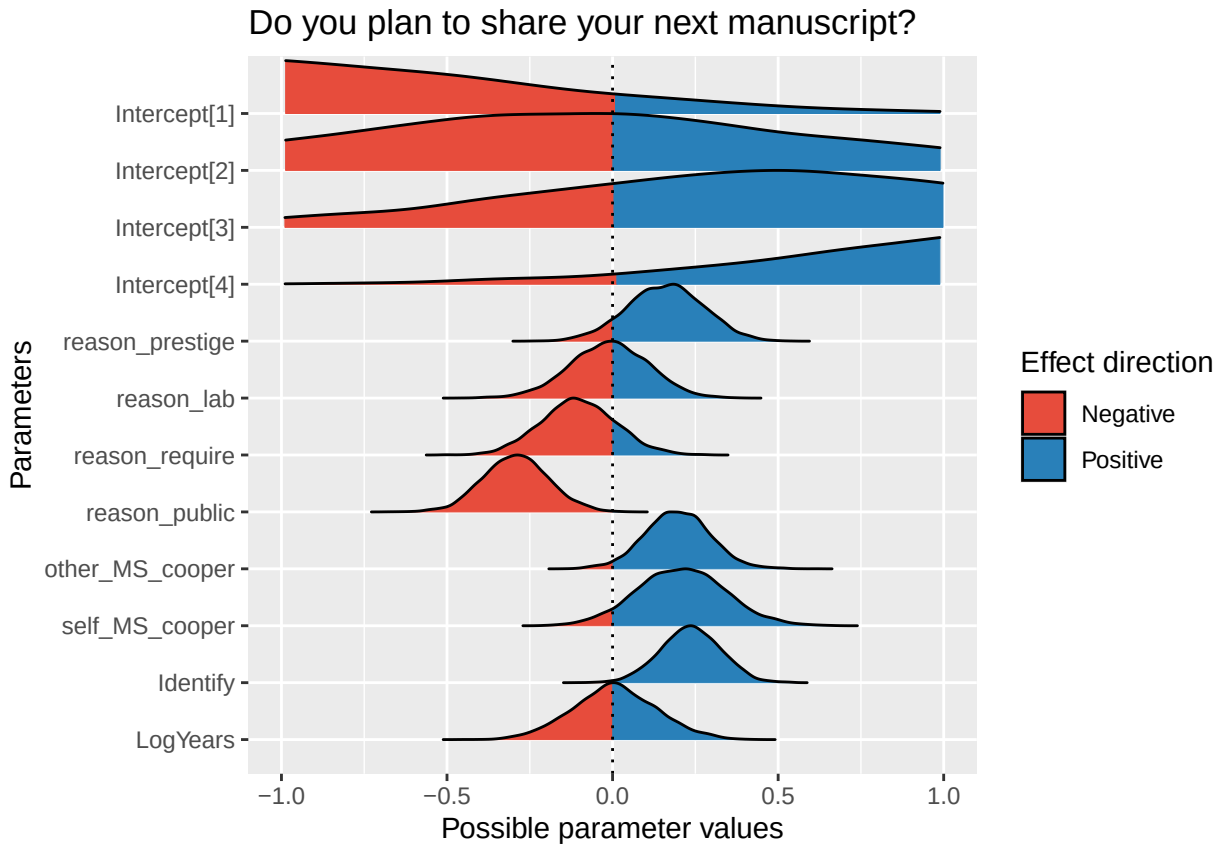
Parameter	ROPE_Percentage
b_Intercept[1]	2.775
b_Intercept[2]	10.850
b_Intercept[3]	7.725
b_Intercept[4]	1.750
b_reason_prestige	29.350

b_reason_lab	60.250
b_reason_require	44.350
b_reason_public	2.850
b_other_MS_cooper	15.900
b_self_MS_cooper	19.875
b_Identify	6.975
b_LogYears	57.675




```
## Probability of Direction
##
## Parameter       |     pd
## ------------------------
## Intercept[1]    | 92.92%
## Intercept[2]    | 55.97%
## Intercept[3]    | 74.75%
## Intercept[4]    | 96.65%
## reason_prestige | 91.53%
## reason_lab      | 53.10%
## reason_require  | 81.73%
## reason_public   | 99.85%
## other_MS_cooper | 97.70%
## self_MS_cooper  | 94.20%
## Identify        | 99.45%
```

```
## LogYears          | 51.92%
```



Based on these analyses, it seems that participants' answers about whether others and themselves share for the public good predicts their answers as to whether they plan to share manuscripts. Surprisingly higher endorsement that themselves or others share for the public good corresponds to lower importance attributed to this behavior. The two cooperation questions marginally predict people's answers. The more you say you and others share their manuscripts to cooperate with others, the more you say you plan to share manuscripts. Finally, the more you say you identify with your field the more you say you plan to share your manuscript. People who say they and others share their manuscript because of the public good are less likely to say that they will share their manuscript. The more someone identifies with their the field, the more they say they will publicly share their manuscript. Finally, both the ROPE and pd analyses agree that there are smaller effects of saying you or others share their manuscript to cooperate with others – which predicts that participants will be more likely to say they will share their next manuscript.

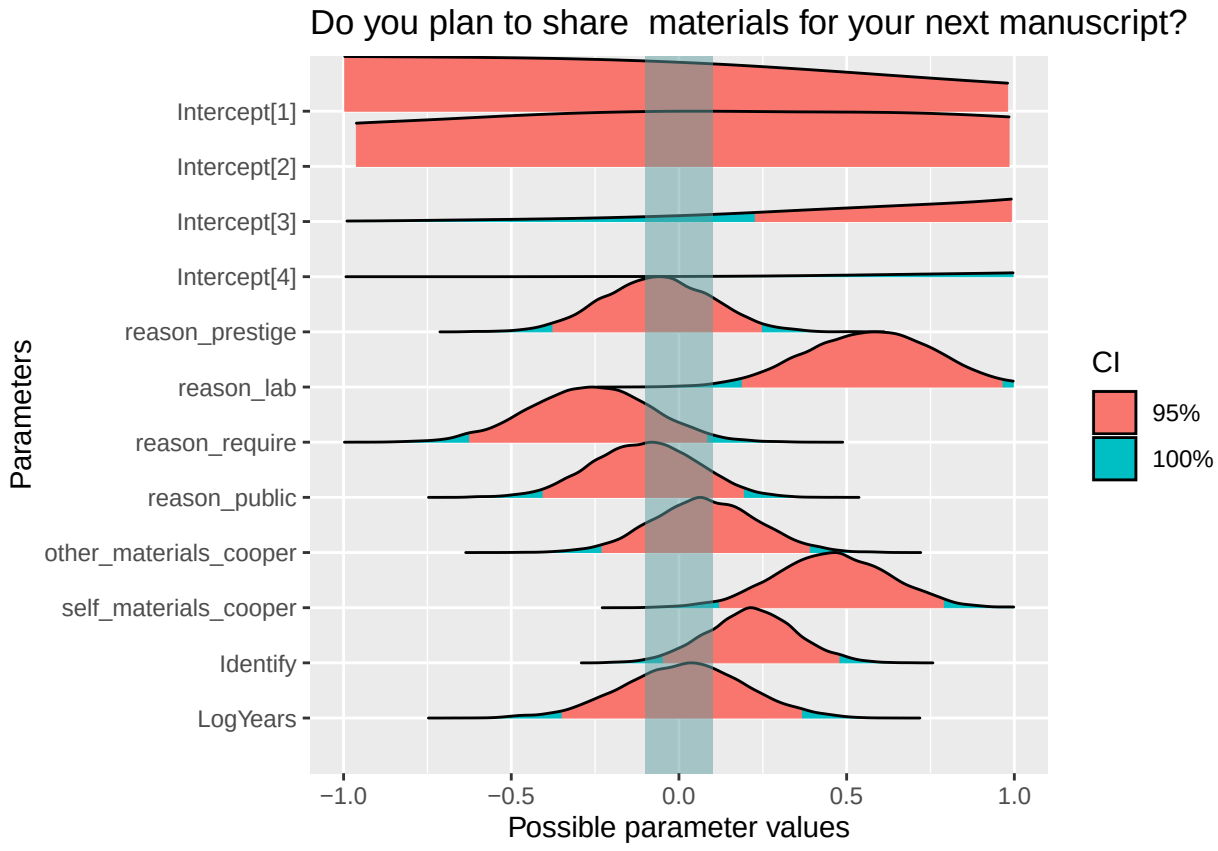
2.6.1.3 Materials

ROPE Percentages

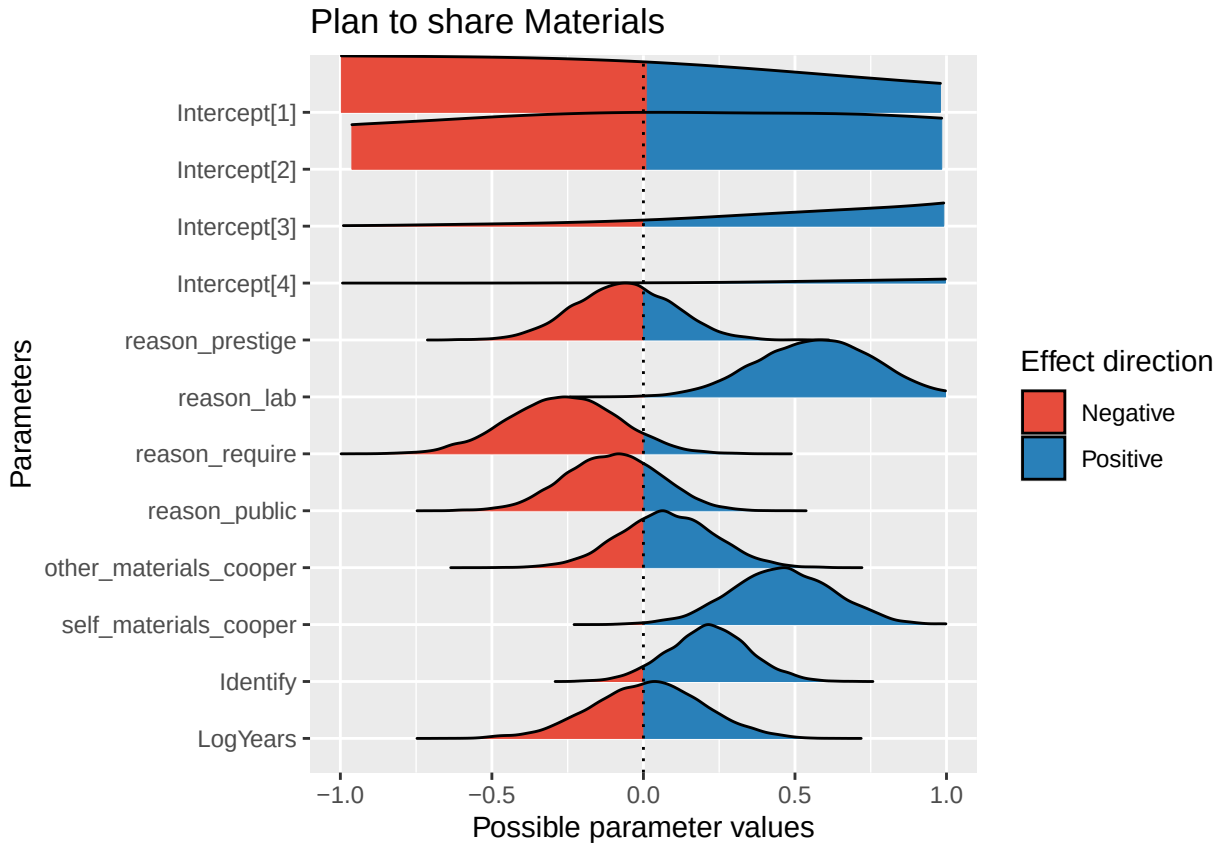
Do you plan to share materials for your next manuscript?

Parameter	ROPE_Percentage
b_Intercept[1]	3.25833333

b_Intercept[2]	5.28333333
b_Intercept[3]	0.72500000
b_Intercept[4]	0.01666667
b_reason_prestige	43.21666667
b_reason_lab	0.73333333
b_reason_require	16.11666667
b_reason_public	40.47500000
b_other_materials_cooper	43.22500000
b_self_materials_cooper	1.95000000
b_Identify	18.44166667
b_LogYears	41.52500000



359

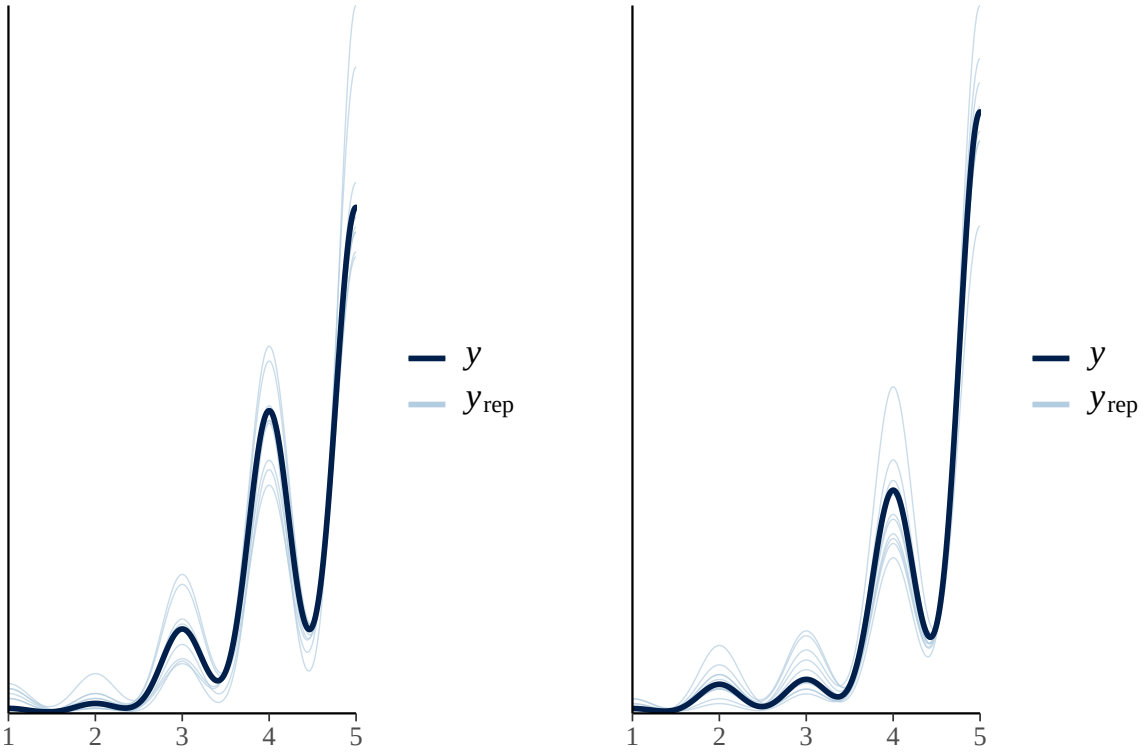


For materials, we find evidence that the more you say yourself and others share materials because of requirements/encouragement from the P.I. of their lab, the more likely they are to say they will share their materials. The more they say others (but not themselves) share to cooperate with other researchers the more likely they are to say they will share their materials.

2.6.2 Importance: Do participants' motivations for sharing or their ideas about other participants' motivations correlate with whether they think its important to share?

2.6.2.1 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```

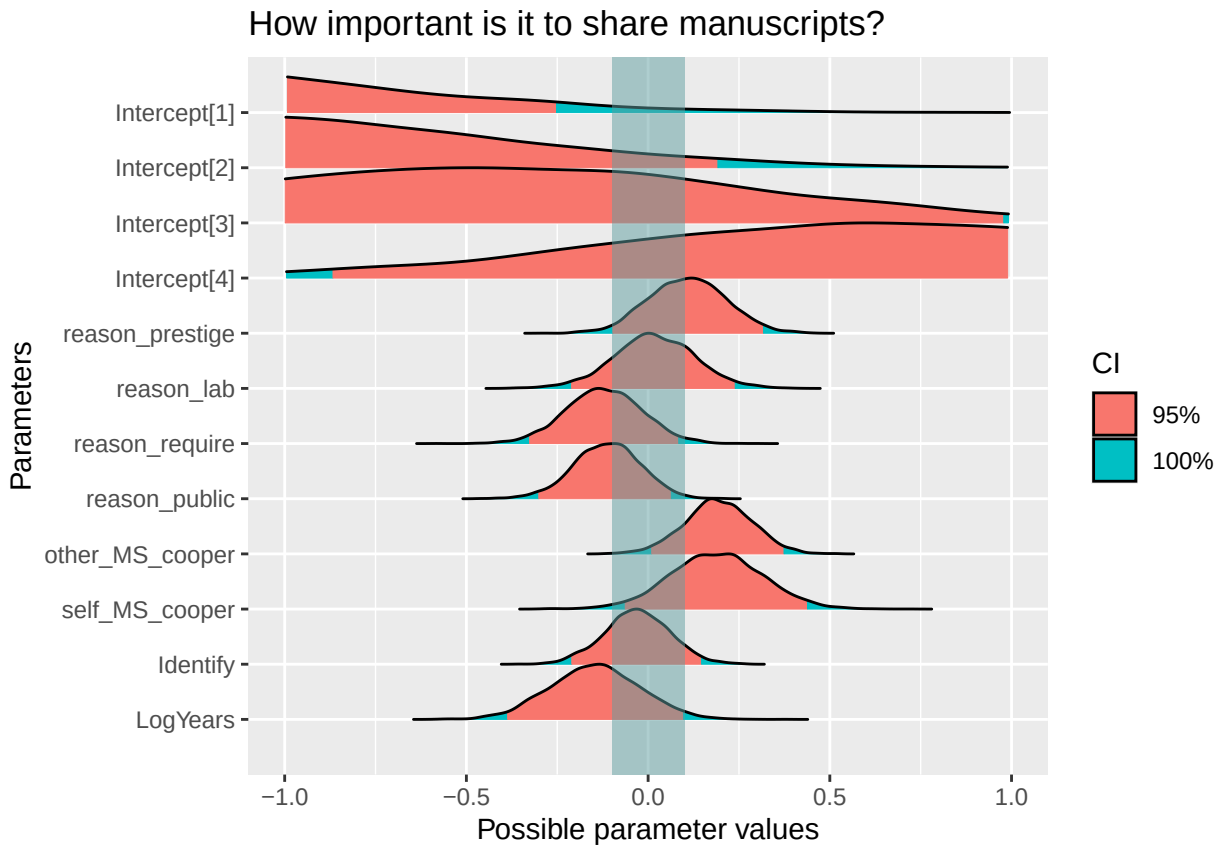


2.6.2.2 Manuscripts

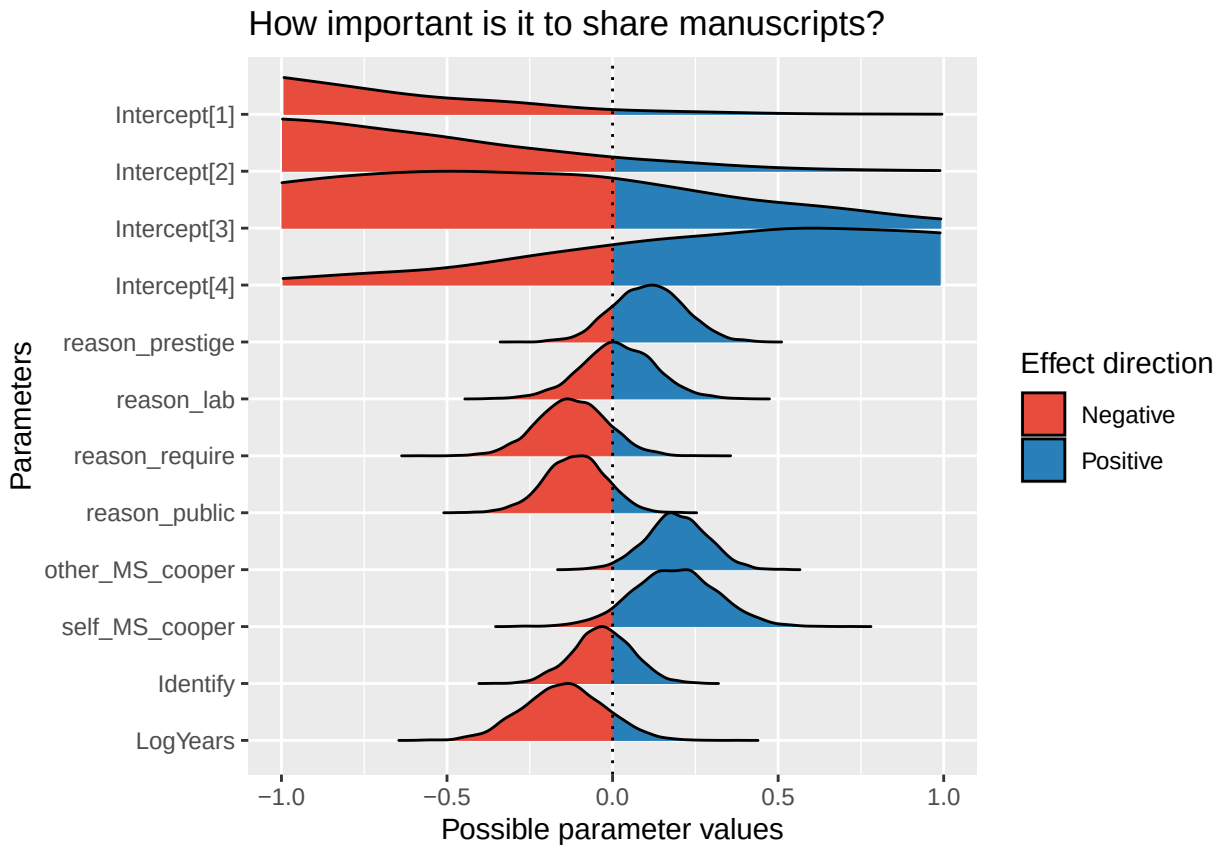
ROPE Percentages

How important is it to share manuscripts?

Parameter	ROPE_Percentage
b_Intercept[1]	0.750
b_Intercept[2]	2.350
b_Intercept[3]	9.300
b_Intercept[4]	7.100
b_reason_prestige	44.475
b_reason_lab	62.850
b_reason_require	39.900
b_reason_public	44.250
b_other_MS_cooper	15.250
b_self_MS_cooper	23.150
b_Identify	71.300
b_LogYears	32.850




```
## Probability of Direction
##
## Parameter       |     pd
## ------------------------
## Intercept[1]    | 98.78%
## Intercept[2]    | 95.50%
## Intercept[3]    | 73.30%
## Intercept[4]    | 80.17%
## reason_prestige | 84.10%
## reason_lab      | 55.83%
## reason_require  | 87.70%
## reason_public   | 89.48%
## other_MS_cooper | 97.97%
## self_MS_cooper  | 93.53%
## Identify        | 63.35%
## LogYears        | 88.00%
```



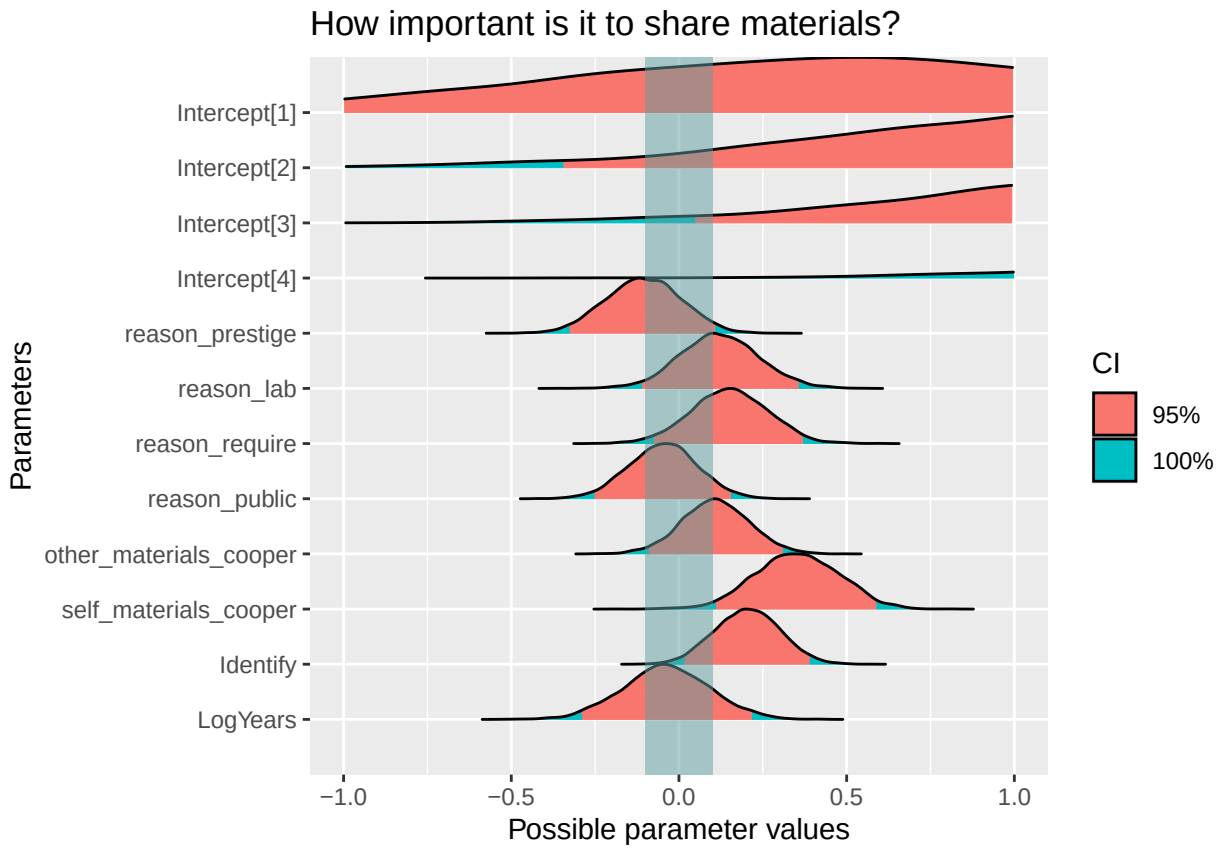
Based on these analyses, there are marginal effects of the two cooperation factors on whether people think its important to share manuscripts with the public. The more that they say others and themselves do it to cooperate with other researchers, the more likely they are to say its important.

2.6.2.3 Materials

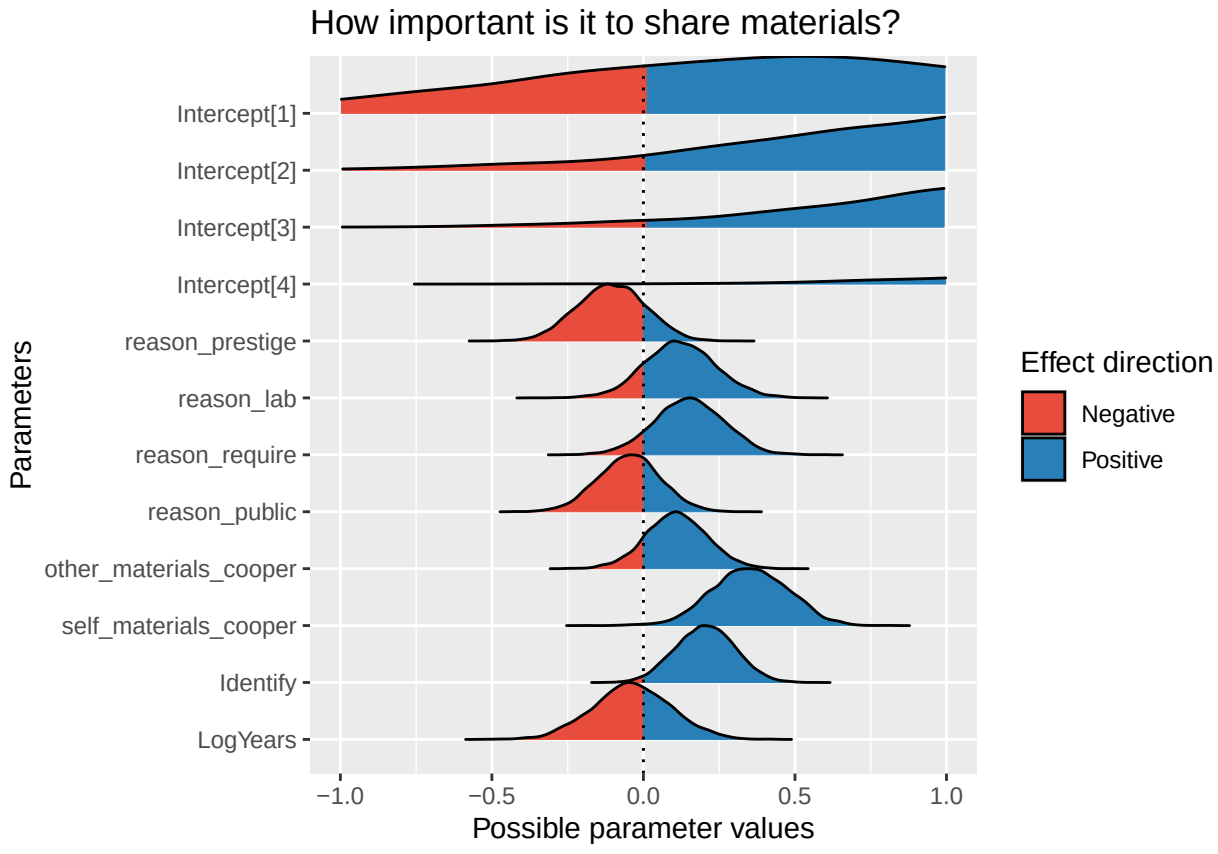
ROPE Percentages

How important is it to share materials?

Parameter	ROPE_Percentage
b_Intercept[1]	7.850
b_Intercept[2]	2.350
b_Intercept[3]	1.275
b_Intercept[4]	0.025
b_reason_prestige	44.475
b_reason_lab	40.475
b_reason_require	31.250
b_reason_public	62.875
b_other_materials_cooper	44.250
b_self_materials_cooper	2.025
b_Identify	14.700
b_LogYears	54.775


How important is it to share materials?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
reason_prestige
reason_lab
reason_require
reason_public
other_materials_cooper
self_materials_cooper
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
CI
95%
100%

394


How important is it to share materials?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
reason_prestige
reason_lab
reason_require
reason_public
other_materials_cooper
self_materials_cooper
Identify
LogYears
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
Effect direction
Negative
Positive

395

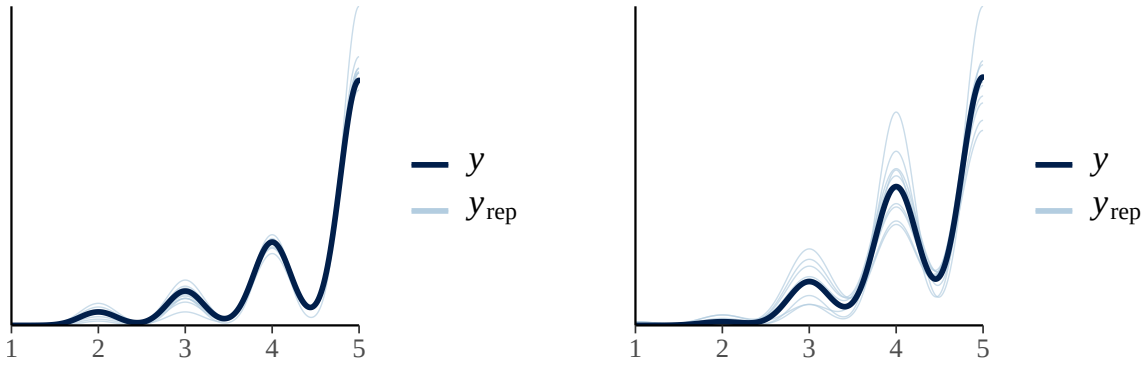
For materials, the more you say you share materials to cooperate with other researchers the more important you say it is to share materials.

2.7 Interactions between perceptions of social dynamics and motivations

2.7.1 Plans: Do beliefs about social dynamics and motivations interact to predict participants' plans to share (only including self cooperation ratings)?

2.7.1.1 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```

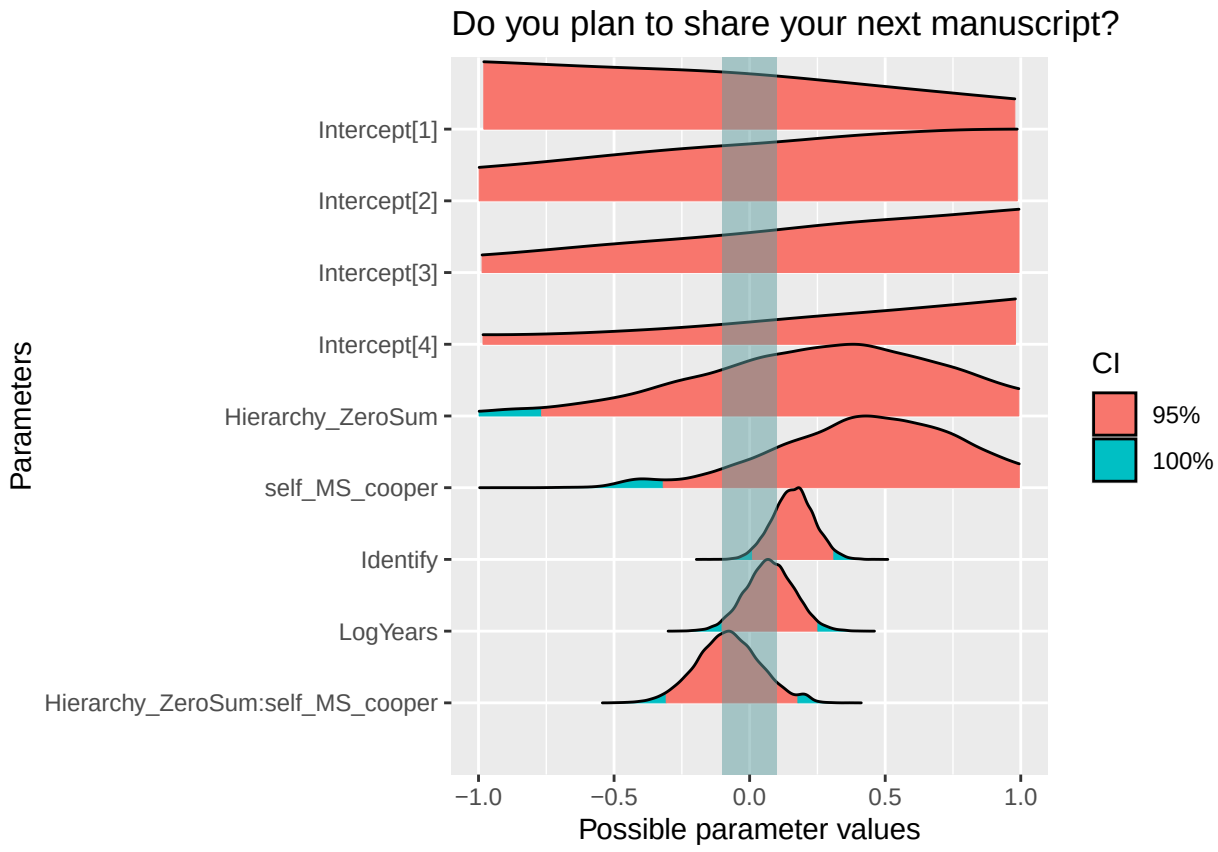


2.7.1.2 Manuscripts

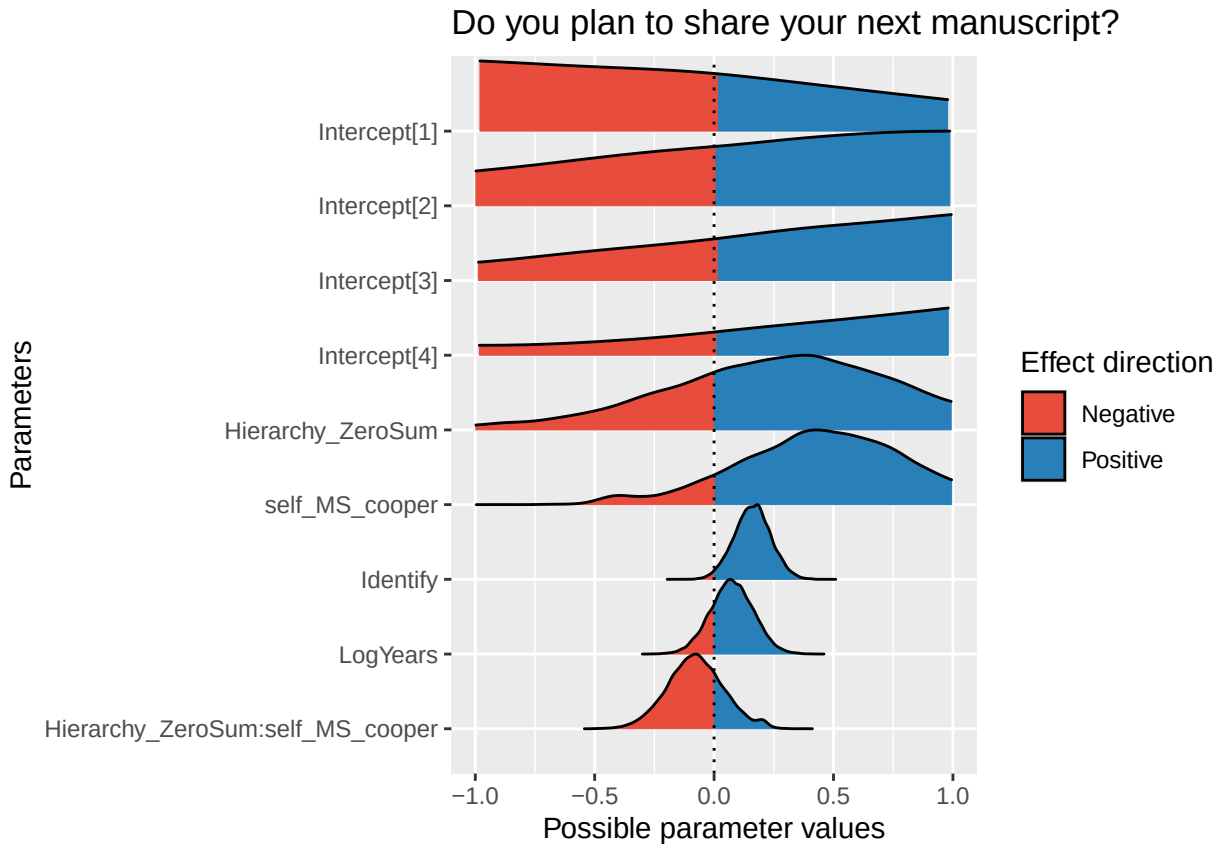
ROPE Percentages

Do you plan to share your next manuscript?

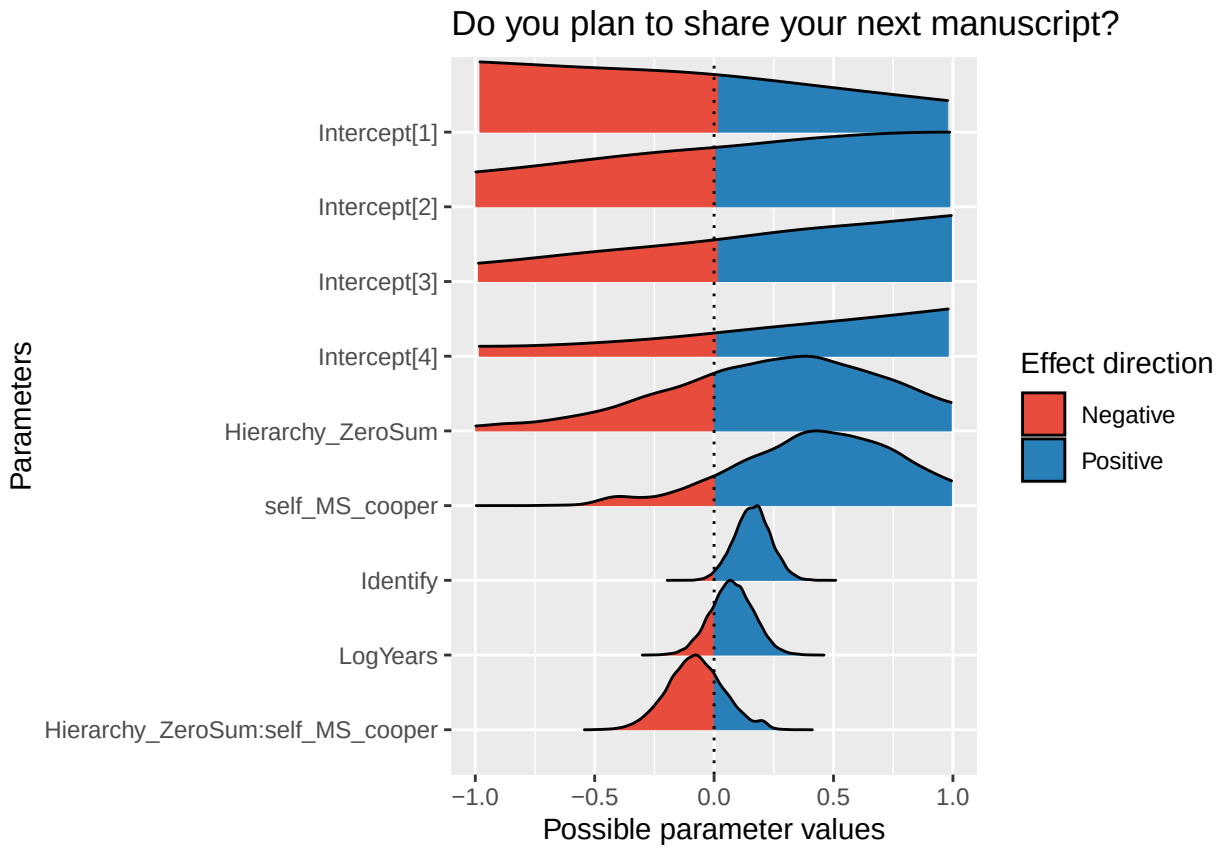
Parameter	ROPE_Percentage
b_Intercept[1]	2.790
b_Intercept[2]	3.920
b_Intercept[3]	2.855
b_Intercept[4]	1.490
b_Hierarchy_ZeroSum	12.570
b_self_MS_cooper	8.990
b_Identify	21.035
b_LogYears	58.430
b_Hierarchy_ZeroSum:self_MS_cooper	50.120


Do you plan to share your next manuscript?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_MS_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_MS_cooper
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
CI
95%
100%

406


Do you plan to share your next manuscript?
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_MS_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_MS_cooper
Parameters
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
Effect direction
Negative
Positive

407



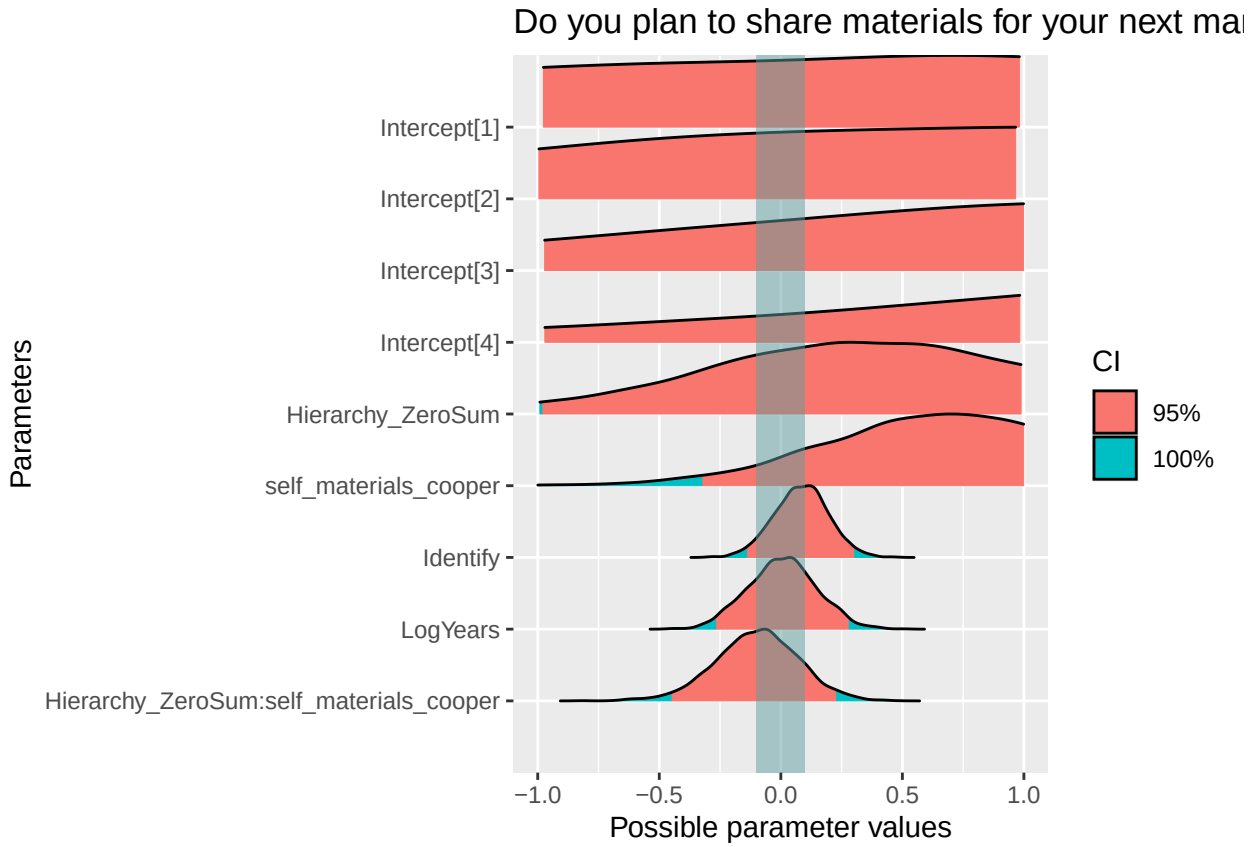
This suggests that for sharing manuscripts there are main effects of of your ideas of social dynamics, and whether you say you share to cooperate, and whether you say other participants share to cooperate with others. Interestingly all three make it more likely that you'll say you'll share your MS. When looking at interactions they are negative, so the more you think your field is hierarchical and the more you think others share for cooperative reasons, the less you share, and same for when thinking about yourself. There is also a three way interaction between these three items…

2.7.1.3 Materials

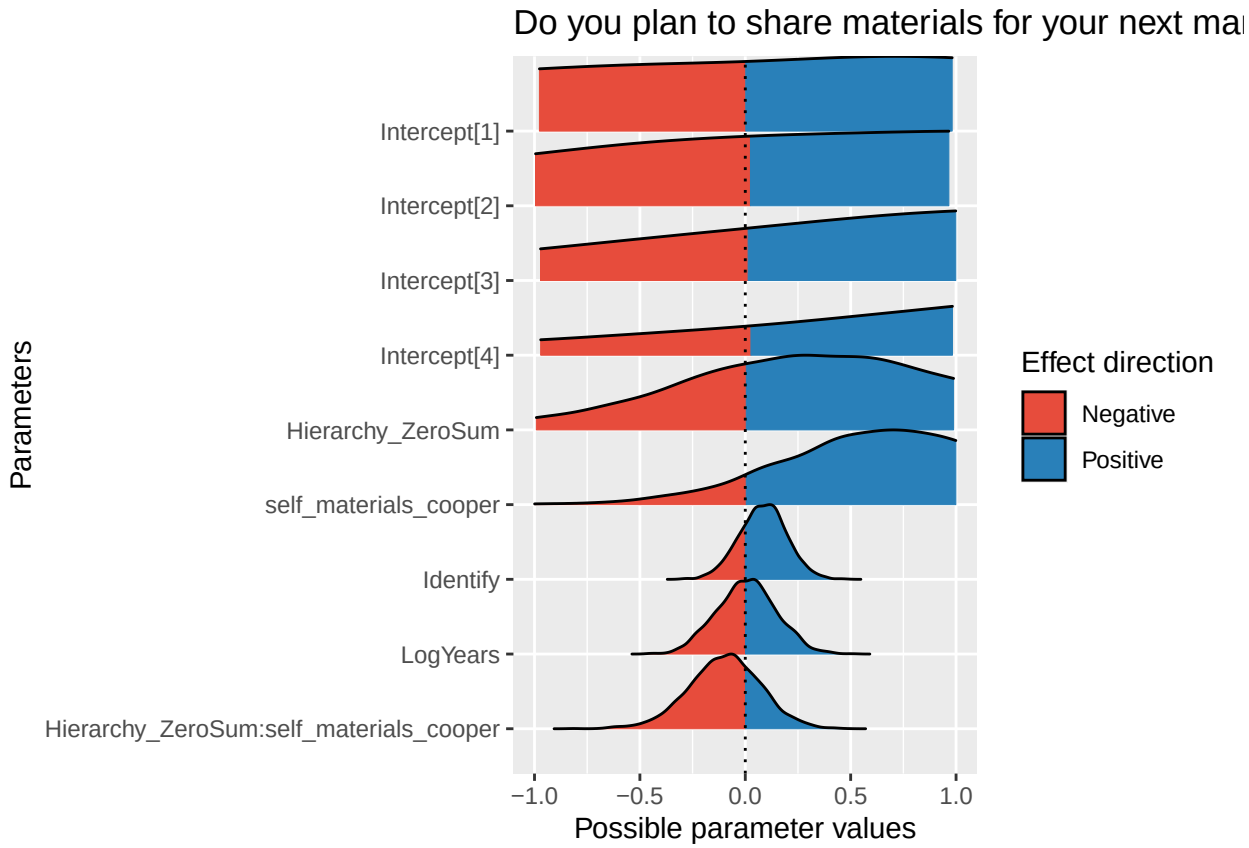
ROPE Percentages

Do you plan to share materials for your next manuscript?

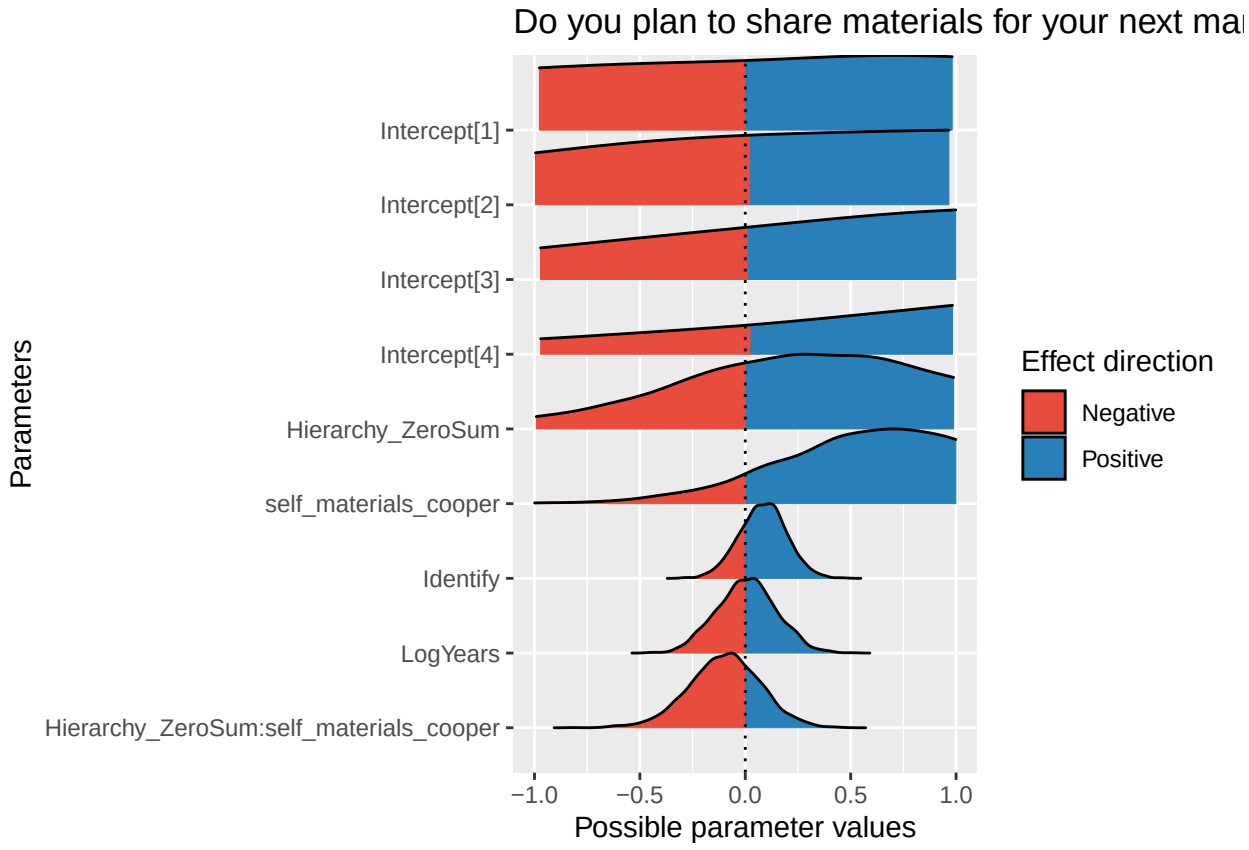
Parameter	ROPE_Percentage
b_Intercept[1]	2.750
b_Intercept[2]	2.900
b_Intercept[3]	2.025
b_Intercept[4]	1.125
b_Hierarchy_ZeroSum	10.200
b_self_materials_cooper	5.875
b_Identify	49.500
b_LogYears	52.675
b_Hierarchy_ZeroSum:self_materials_cooper	39.625


Do you plan to share materials for your next ma
Parameters
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_materials_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_materials_cooper
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
CI
95%
100%

416


Do you plan to share materials for your next ma
Parameters
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_materials_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_materials_cooper
−1.0
−0.5
0.0
0.5
1.0
Possible parameter values
Effect direction
Negative
Positive

417

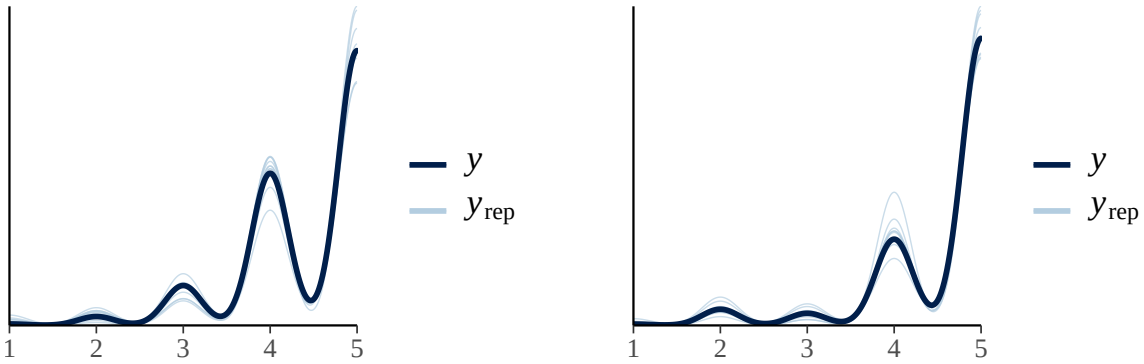


There are no clear effects on whether people plan to share materials.

2.7.2 Importance: Do participants' ideas of social dynamics and ideas about reasons interact to predict whether they say its important to share? (only including self cooperation ratings)

2.7.2.1 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```

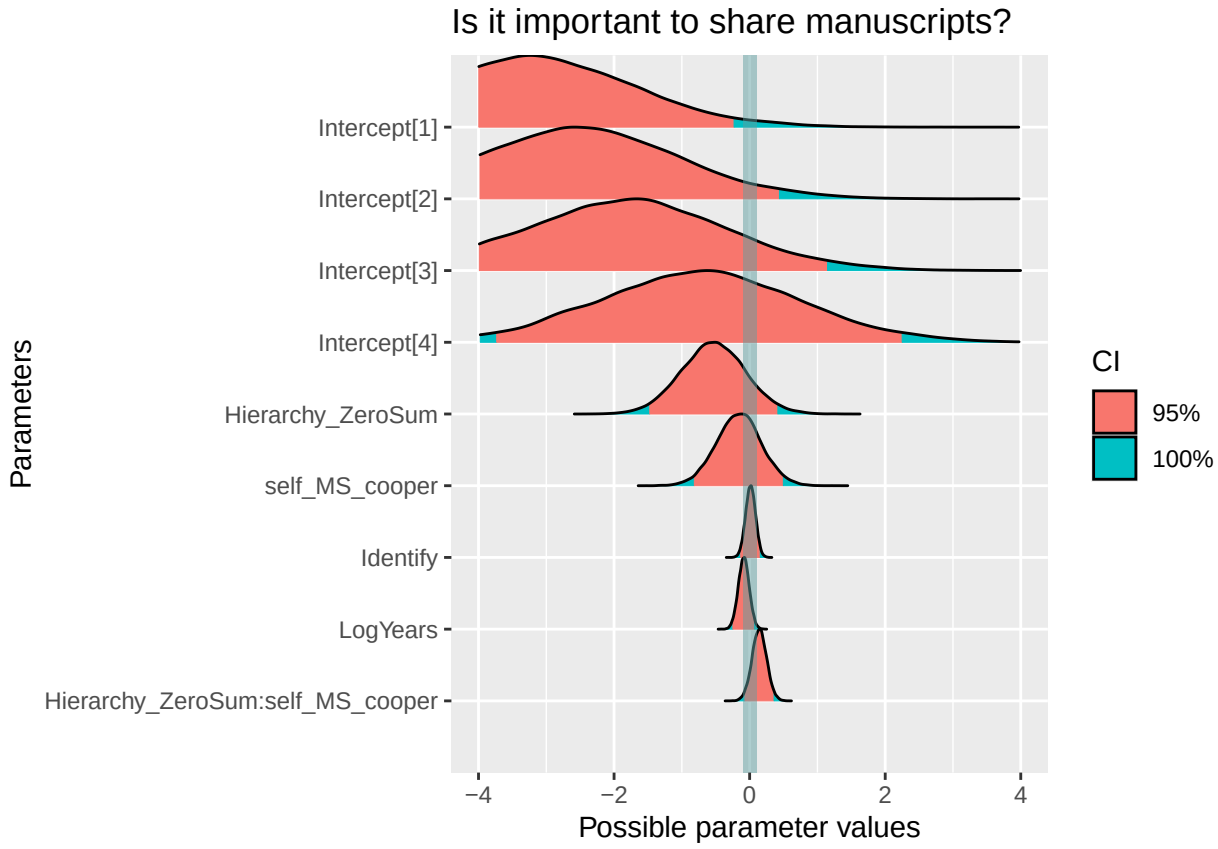


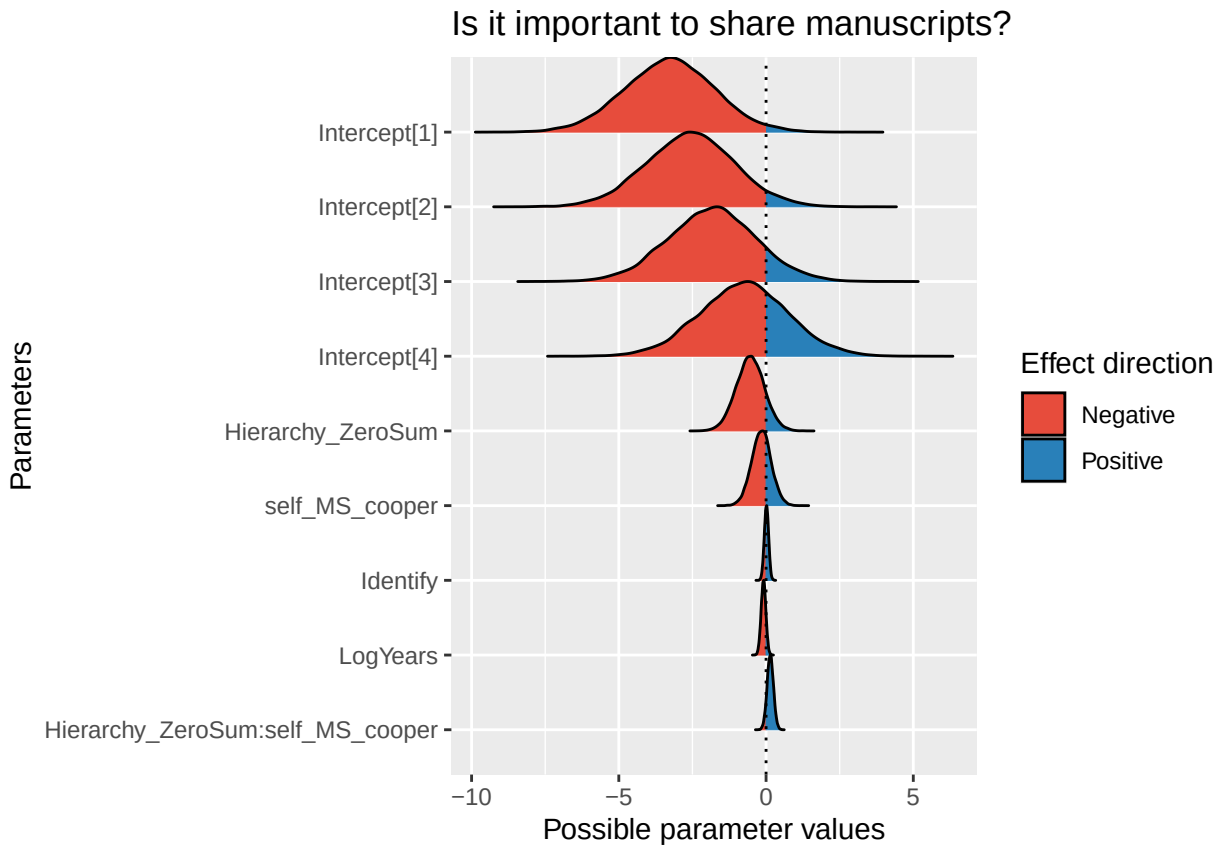
2.7.2.2 Manuscripts

ROPE Percentages

Is it important to share manuscripts?

Parameter	ROPE_Percentage
b_Intercept[1]	0.485
b_Intercept[2]	1.090
b_Intercept[3]	2.510
b_Intercept[4]	4.740
b_Hierarchy_ZeroSum	8.690
b_self_MS_cooper	21.985
b_Identify	81.780
b_LogYears	55.500
b_Hierarchy_ZeroSum:self_MS_cooper	33.105





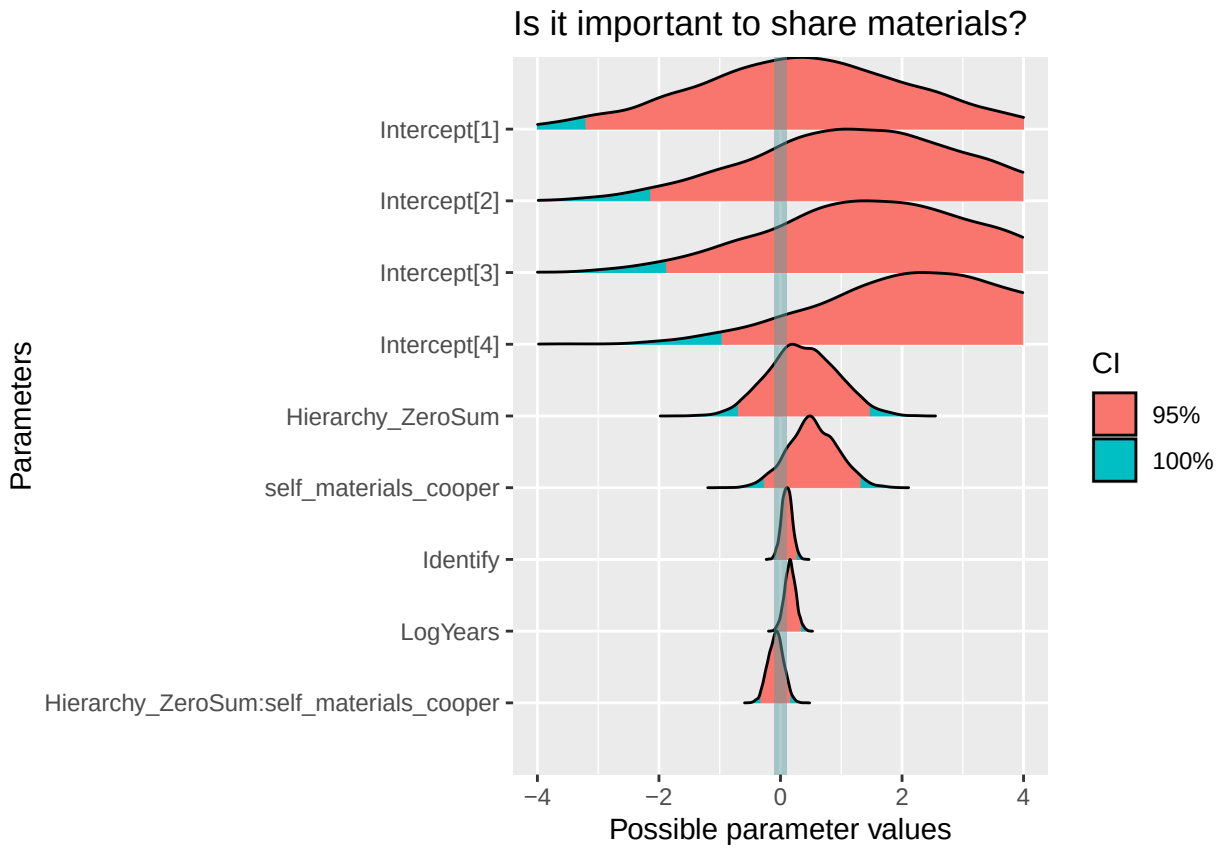
In this model there are no clear effects

2.7.2.3 Materials

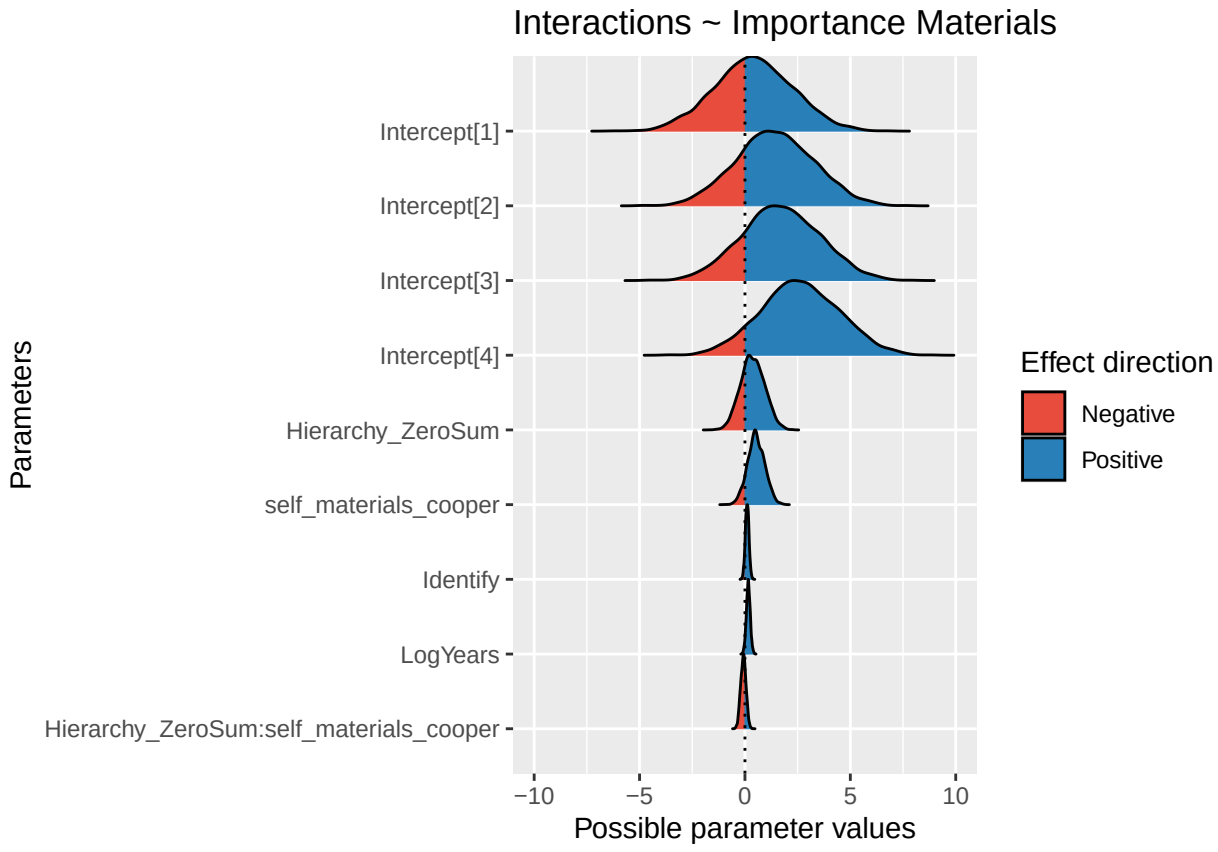
ROPE Percentages

Is it important to share materials?

Parameter	ROPE_Percentage
b_Intercept[1]	4.325
b_Intercept[2]	2.775
b_Intercept[3]	2.700
b_Intercept[4]	1.800
b_Hierarchy_ZeroSum	11.700
b_self_materials_cooper	8.100
b_Identify	47.350
b_LogYears	26.050
b_Hierarchy_ZeroSum:self_materials_cooper	49.575


Is it important to share materials?
Parameters
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_materials_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_materials_cooper
−4
−2
0
2
4
Possible parameter values
CI
95%
100%

431


Interactions ~ Importance Materials
Parameters
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_materials_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_materials_cooper
−10
−5
0
5
10
Possible parameter values
Effect direction
Negative
Positive

432

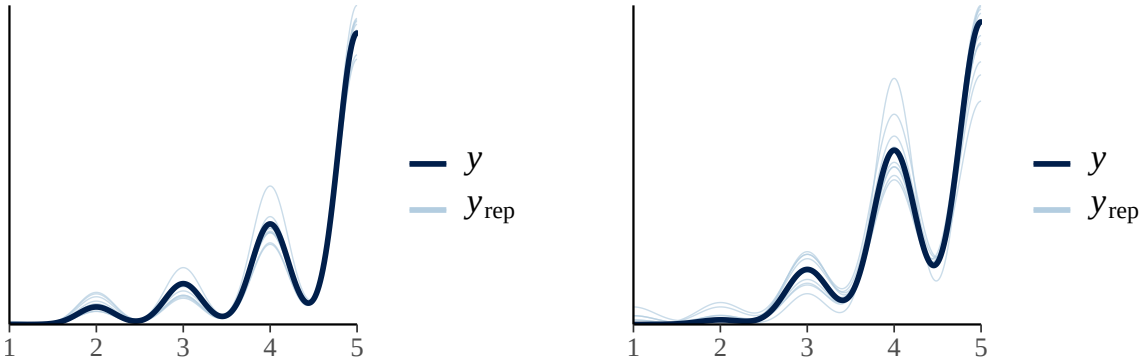
There are also no clear effects on whether people say its important to share materials.

2.8 3-way interaction between social dynamics, self cooperation and other cooperation

2.8.1 Plans: Do beliefs about social dynamics and reasons interact to predict participants' plans to share? (Including 3-way interaction)

2.8.1.1 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```



2.8.1.2 Manuscripts

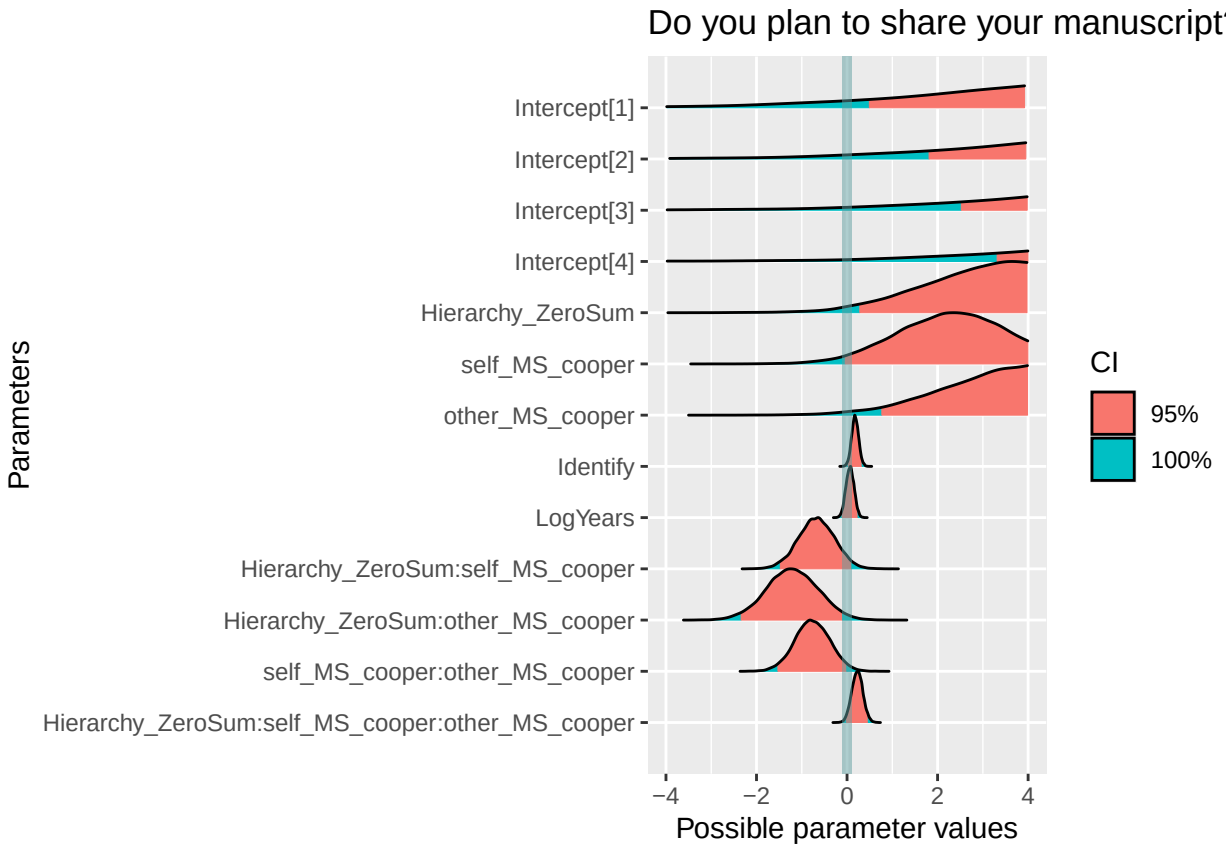
```
## Possible multicollinearity between b_other_MS_cooper and b_self_MS_cooper (r = 0.89), b_Hiera
```

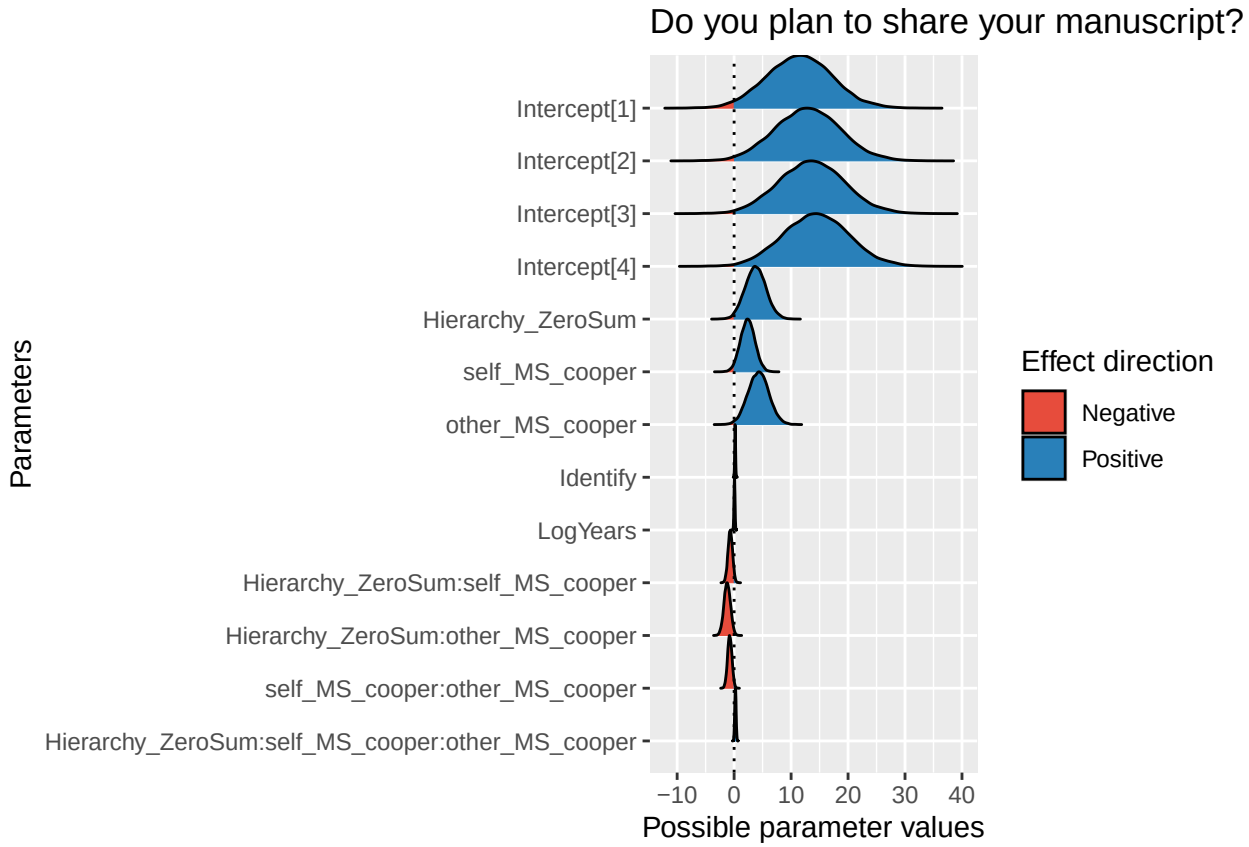
ROPE Percentages

Do you plan to share your manuscript?

Parameter	ROPE_Percentage
b_Intercept[1]	0.155
b_Intercept[2]	0.160
b_Intercept[3]	0.060
b_Intercept[4]	0.055
b_Hierarchy_ZeroSum	0.605
b_self_MS_cooper	1.040
b_other_MS_cooper	0.320
b_Identify	15.395
b_LogYears	61.705
b_Hierarchy_ZeroSum:self_MS_cooper	5.060
b_Hierarchy_ZeroSum:other_MS_cooper	1.490
b_self_MS_cooper:other_MS_cooper	3.015
b_Hierarchy_ZeroSum:self_MS_cooper:other_MS_cooper	14.735

```
## Possible multicollinearity between b_other_MS_cooper and b_self_MS_cooper (r = 0.89), b_Hiera
```






```
## Probability of Direction
##
## Parameter                                                |     pd
## ---------------------------------------------------------------
## Intercept[1]                                             | 97.91%
## Intercept[2]                                             | 98.97%
## Intercept[3]                                             | 99.27%
## Intercept[4]                                             | 99.51%
## Hierarchy_ZeroSum                                        | 98.40%
## self_MS_cooper                                           | 97.20%
## other_MS_cooper                                          | 99.17%
## Identify                                                 | 98.85%
## LogYears                                                 | 76.31%
## Hierarchy_ZeroSum:self_MS_cooper                         | 95.60%
## Hierarchy_ZeroSum:other_MS_cooper                        | 98.35%
## self_MS_cooper:other_MS_cooper                           | 97.72%
## Hierarchy_ZeroSum:self_MS_cooper:other_MS_cooper         | 96.95%
```

This suggests that there are main effects of of your ideas of social dynamics, and whether you say you share to cooperate, and whether you say other participants share to cooperate with others. Interestingly all three make it more likely that you'll say you'll share your manuscript. When looking at interactions they are negative, so the more you think your field is hierarchical and

the more you think others share for cooperative reasons, the less you share, and same for when thinking about yourself. There is also a three way interaction between these three items.

2.8.1.3 Materials

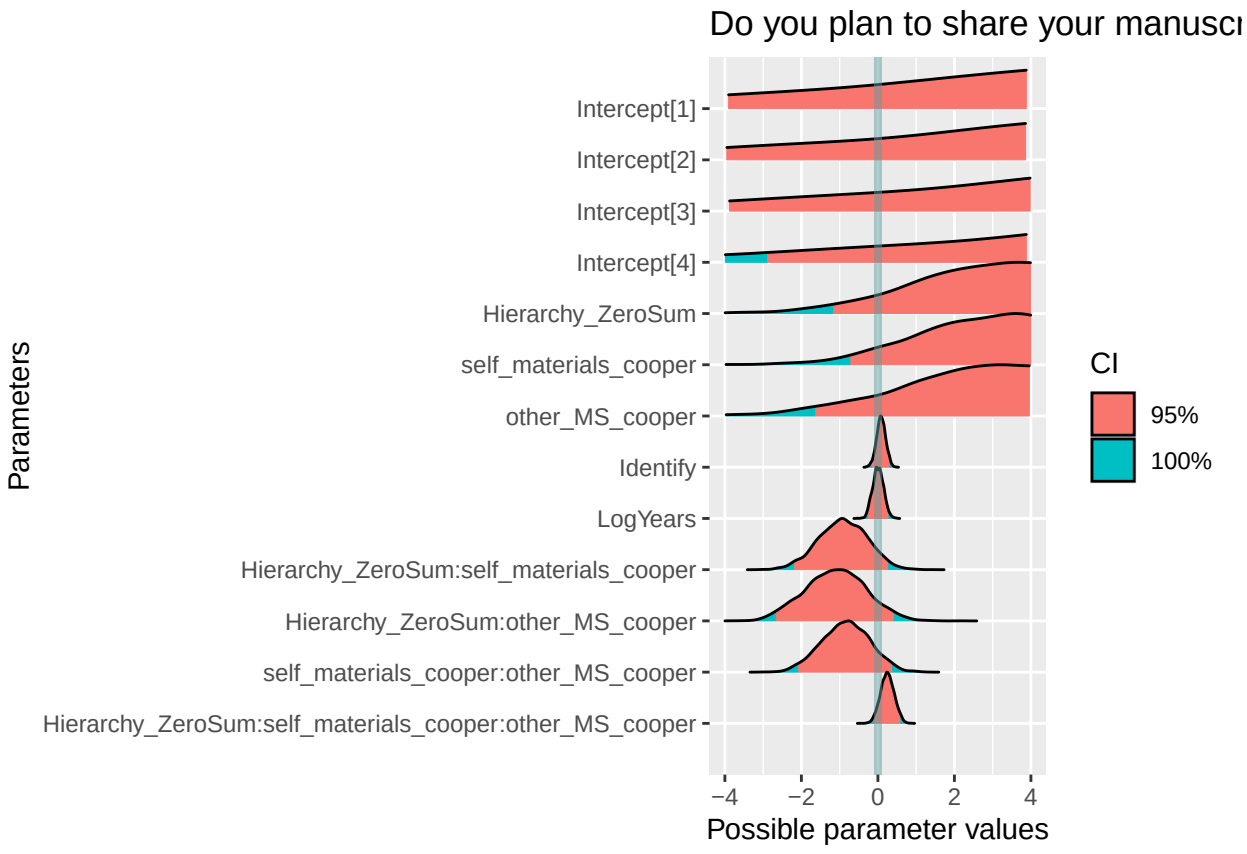
```
## Possible multicollinearity between b_Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper
```

ROPE Percentages

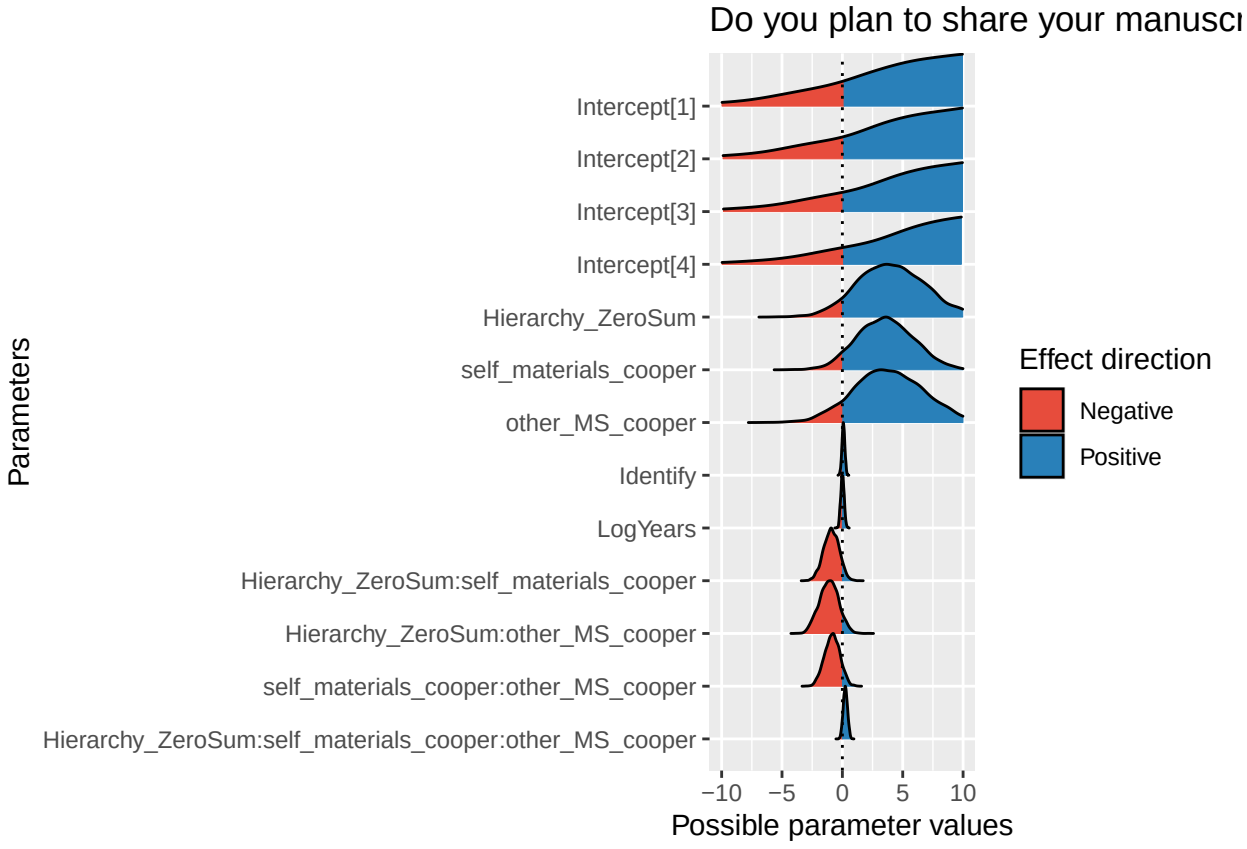
Do you plan to share your materials?

Parameter	ROPE_Percentage
b_Intercept[1]	0.275
b_Intercept[2]	0.275
b_Intercept[3]	0.325
b_Intercept[4]	0.125
b_Hierarchy_ZeroSum	0.775
b_self_materials_cooper	1.300
b_other_MS_cooper	1.125
b_Identify	49.000
b_LogYears	51.600
b_Hierarchy_ZeroSum:self_materials_cooper	4.600
b_Hierarchy_ZeroSum:other_MS_cooper	3.675
b_self_materials_cooper:other_MS_cooper	4.950
b_Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper	17.625

```
## Possible multicollinearity between b_Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper
```


Do you plan to share your manusci
Parameters
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_materials_cooper
other_MS_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_materials_cooper
Hierarchy_ZeroSum:other_MS_cooper
self_materials_cooper:other_MS_cooper
Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper
−4
−2
0
2
4
Possible parameter values
CI
95%
100%

473


Do you plan to share your manusci
Parameters
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_materials_cooper
other_MS_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_materials_cooper
Hierarchy_ZeroSum:other_MS_cooper
self_materials_cooper:other_MS_cooper
Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper
−10
−5
0
5
10
Possible parameter values
Effect direction
Negative
Positive

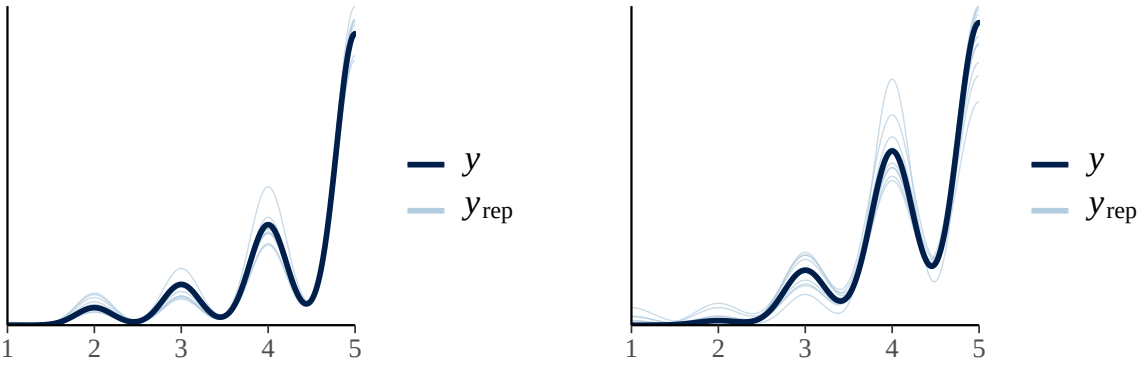
474

```
## Probability of Direction
##
## Parameter                                                     |     pd
## ------------------------------------------------------------------------
## Intercept[1]                                                  | 90.80%
## Intercept[2]                                                  | 91.80%
## Intercept[3]                                                  | 93.23%
## Intercept[4]                                                  | 94.67%
## Hierarchy_ZeroSum                                             | 93.10%
## self_materials_cooper                                         | 94.30%
## other_MS_cooper                                               | 91.17%
## Identify                                                      | 76.72%
## LogYears                                                      | 51.32%
## Hierarchy_ZeroSum:self_materials_cooper                       | 92.77%
## Hierarchy_ZeroSum:other_MS_cooper                             | 91.83%
## self_materials_cooper:other_MS_cooper                         | 90.70%
## Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper       | 91.95%
```

The effects are trending in a similar direction for materials: there are main effects of of your ideas of social dynamics, and whether you say you share to cooperate, and whether you say other participants share to cooperate with others. Interestingly all three make it more likely that you'll say you'll share your materials. When looking at interactions they are negative, so the more you think your field is hierarchical and the more you think others share for cooperative reasons, the less you share, and same for when thinking about yourself. There is also a three way interaction between these three items.

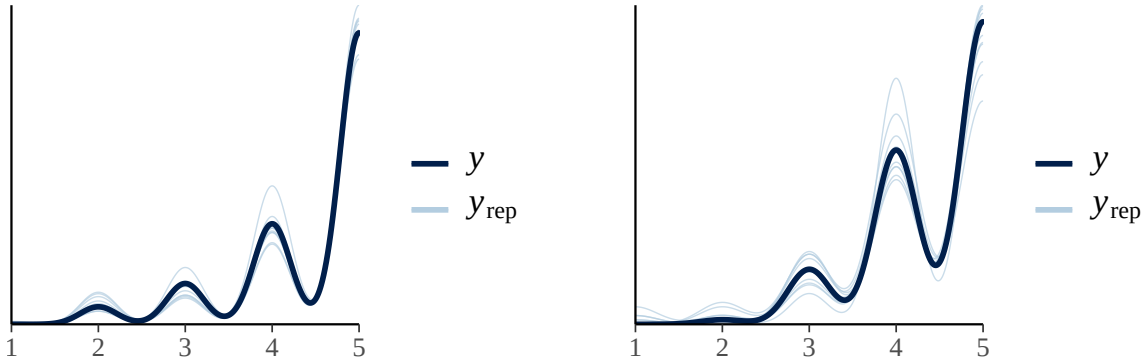
2.8.2 Importance: Do participants' ideas of social dynamics and ideas about reasons interact to predict whether they say its important to share? (Including 3-way interaction)

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```



2.8.2.1 Model Check

```
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
## Using 10 posterior draws for ppc type 'dens_overlay' by default.
```



2.8.2.2 Manuscripts

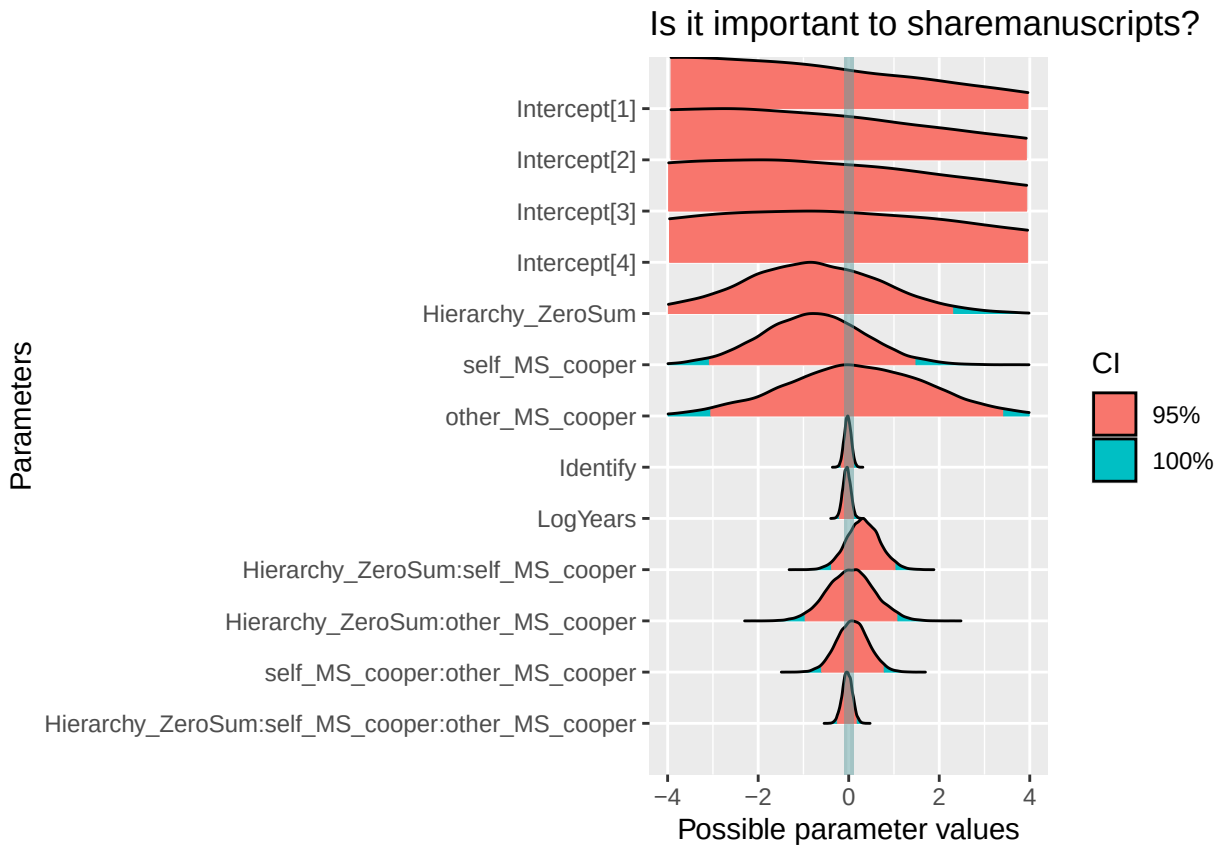
```
## Possible multicollinearity between b_other_MS_cooper and b_self_MS_cooper (r = 0.89), b_Hiera
```

ROPE Percentages

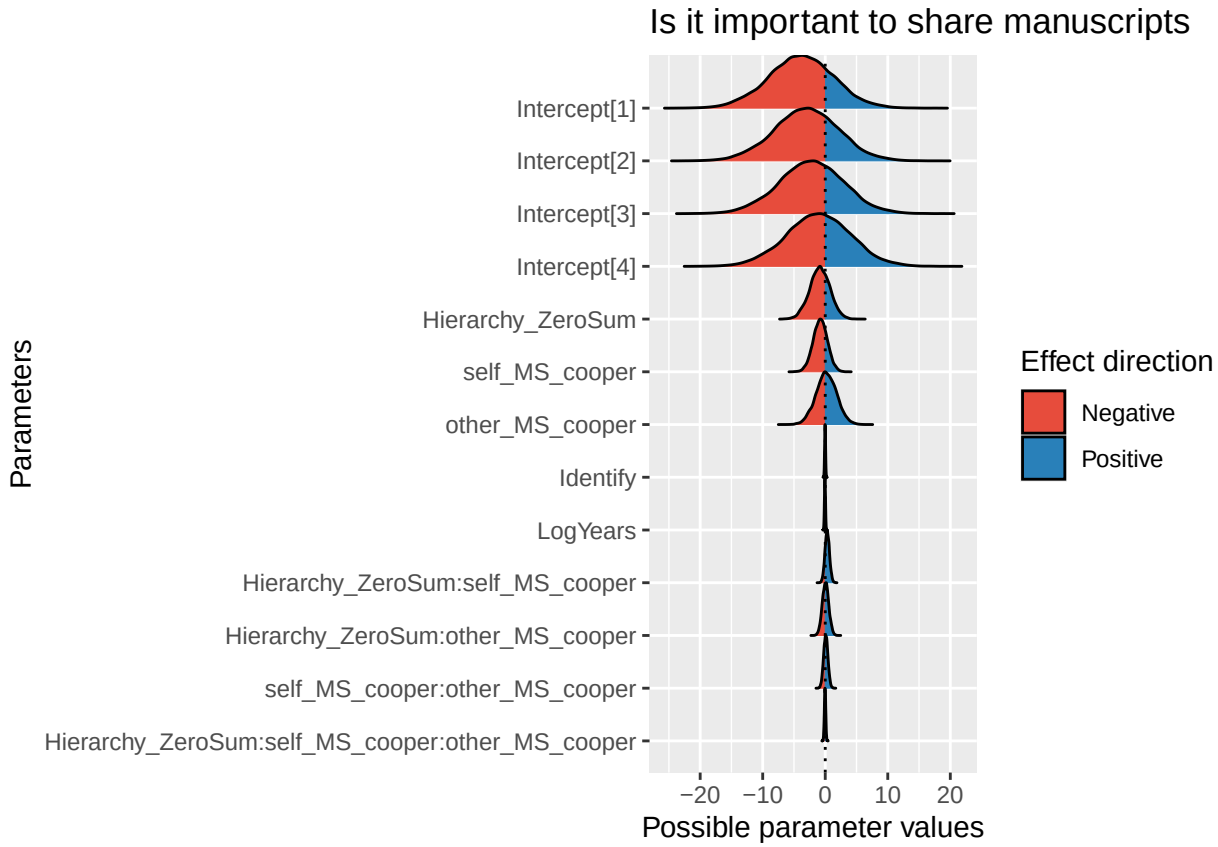
Is it important to share Manuscripts?

Parameter	ROPE_Percentage
b_Intercept[1]	1.180
b_Intercept[2]	1.315
b_Intercept[3]	1.330
b_Intercept[4]	1.435
b_Hierarchy_ZeroSum	4.320
b_self_MS_cooper	5.540
b_other_MS_cooper	5.105
b_Identify	78.795
b_LogYears	70.525
b_Hierarchy_ZeroSum:self_MS_cooper	15.185
b_Hierarchy_ZeroSum:other_MS_cooper	15.070
b_self_MS_cooper:other_MS_cooper	21.415
b_Hierarchy_ZeroSum:self_MS_cooper:other_MS_cooper	61.555

```
## Possible multicollinearity between b_other_MS_cooper and b_self_MS_cooper (r = 0.89), b_Hiera
```




```
## Probability of Direction
##
## Parameter                                                |     pd
## ---------------------------------------------------------------
## Intercept[1]                                             | 77.41%
## Intercept[2]                                             | 72.01%
## Intercept[3]                                             | 66.61%
## Intercept[4]                                             | 58.41%
## Hierarchy_ZeroSum                                        | 70.05%
## self_MS_cooper                                           | 75.61%
## other_MS_cooper                                          | 54.02%
## Identify                                                 | 61.68%
## LogYears                                                 | 69.44%
## Hierarchy_ZeroSum:self_MS_cooper                         | 81.09%
## Hierarchy_ZeroSum:other_MS_cooper                        | 53.69%
## self_MS_cooper:other_MS_cooper                           | 59.63%
## Hierarchy_ZeroSum:self_MS_cooper:other_MS_cooper         | 60.70%
```



529

530 #### 2.8.2.3 Materials

531 `## Possible multicollinearity between b_Hierarchy_ZeroSum:other_MS_cooper and b_self_materials_c`

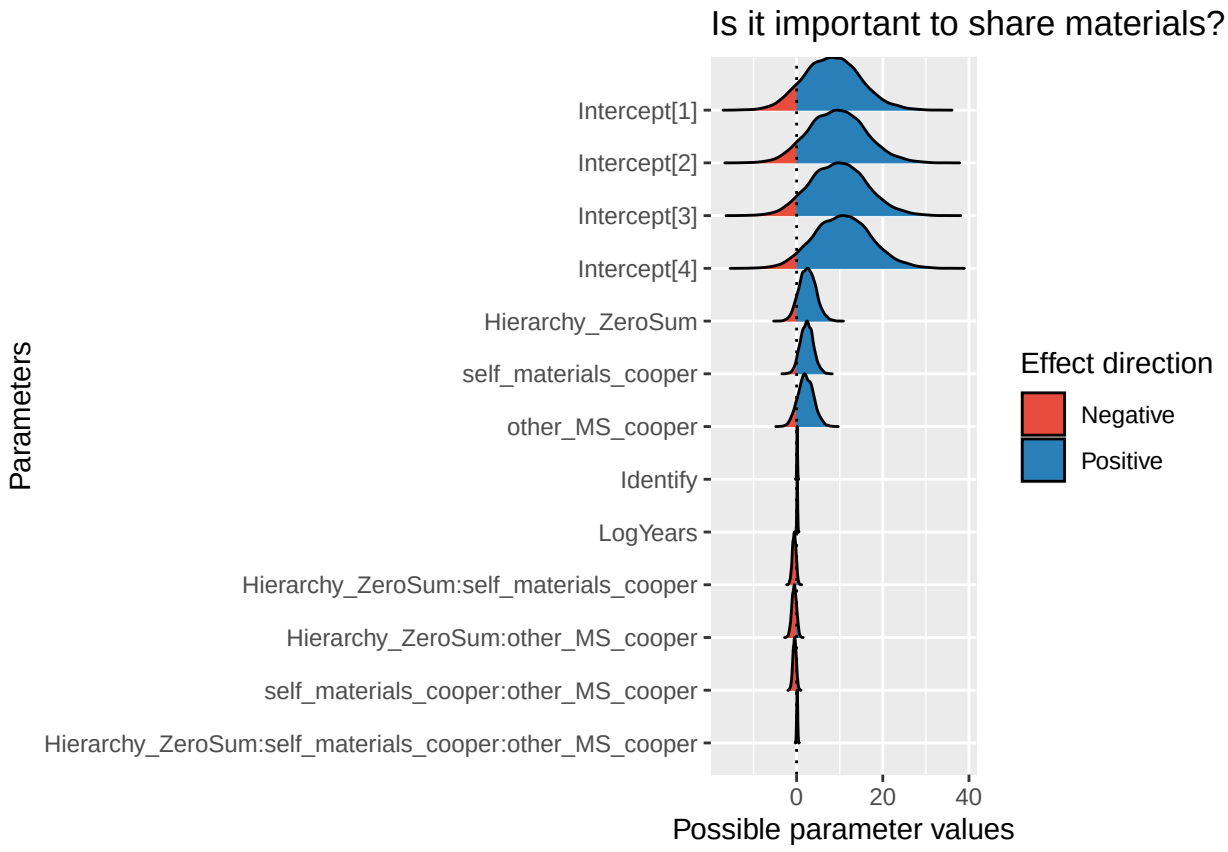
ROPE Percentages

Is it important to share materials?

Parameter	ROPE_Percentage
b_Intercept[1]	0.350
b_Intercept[2]	0.475
b_Intercept[3]	0.350
b_Intercept[4]	0.375
b_Hierarchy_ZeroSum	2.000
b_self_materials_cooper	1.450
b_other_MS_cooper	2.275
b_Identify	38.575
b_LogYears	34.850
b_Hierarchy_ZeroSum:self_materials_cooper	8.700
b_Hierarchy_ZeroSum:other_MS_cooper	8.650
b_self_materials_cooper:other_MS_cooper	10.125
b_Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper	39.275

532 `## Possible multicollinearity between b_Hierarchy_ZeroSum:other_MS_cooper and b_self_materials_c`


```
## Probability of Direction
##
## Parameter                                                |     pd
## ---------------------------------------------------------------------
## Intercept[1]                                             | 89.88%
## Intercept[2]                                             | 92.90%
## Intercept[3]                                             | 93.55%
## Intercept[4]                                             | 95.53%
## Hierarchy_ZeroSum                                        | 90.55%
## self_materials_cooper                                    | 95.15%
## other_MS_cooper                                          | 88.02%
## Identify                                                 | 93.10%
## LogYears                                                 | 92.20%
## Hierarchy_ZeroSum:self_materials_cooper                  | 90.25%
## Hierarchy_ZeroSum:other_MS_cooper                        | 84.97%
## self_materials_cooper:other_MS_cooper                    | 89.08%
## Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper | 85.17%
```


Is it important to share materials?
Parameters
Intercept[1]
Intercept[2]
Intercept[3]
Intercept[4]
Hierarchy_ZeroSum
self_materials_cooper
other_MS_cooper
Identify
LogYears
Hierarchy_ZeroSum:self_materials_cooper
Hierarchy_ZeroSum:other_MS_cooper
self_materials_cooper:other_MS_cooper
Hierarchy_ZeroSum:self_materials_cooper:other_MS_cooper
0
20
40
Possible parameter values
Effect direction
Negative
Positive

551